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Service Manual

ORDER NO.
CRT3604

HIGH POWER CD PLAYER WITH FM/AM TUNER

DEH-1800/XU/UC
DEH-1850/XU/ES
DEH-1850/XU/CN

COMPACT disc DIGITAL AUDIO

This service manual should be used together with the following manual(s) listed below. For the parts numbers, adjustments, etc. which are not shown in this manual, refer to the following manual(s).

Model No.	Order No.	Mech. Module	Remarks
DEH-1850/XN/ES	CRT3552		
CX-3166	CRT3582	S10.5STD	CD Mech. Module:Circuit Descriptions, Mech. Descriptions, Disassembly

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936

K-ZZA. NOV. 2005 Printed in Japan

SAFETY INFORMATION

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

EXPLODED VIEWS AND PARTS LIST

PACKING(Page 6)

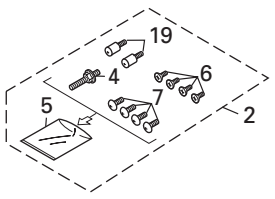
PACKING SECTION PARTS LIST

*:Non spare part

Mark	No.	Description	DEH-1850/XN/ES	DEH-1800/XU/UC
	1	Accessory Assy	CEA4850	CEA4610
	2	Screw Assy	CEA3849	CEA6002
	11	Polyethylene Bag	CEG-162	CEG1173
	12	Carton	CHG5639	CHG5641
	13	Contain Box	CHL5639	CHL5641
	14	Protector	CHP2664	CHP2788
	15	Protector	CHP2868	CHP2869
	16-1	Owner's Manual	CRD4039	CRD4035
	16-2	Installation Manual	CRD4030	CRD4028
*	16-4	Warranty Card	Not used	CRY1247
	18	Case Assy	CXB3520	Not used
	19	Fixing Screw	Not used	CBA1994

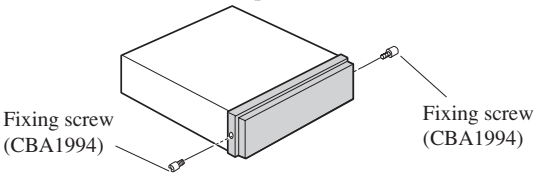
Mark	No.	Description	DEH-1850/XN/ES	DEH-1850/XU/ES
	12	Carton	CHG5639	CHG5650
	13	Contain Box	CHL5639	CHL5650
	14	Protector	CHP2664	CHP2788
	15	Protector	CHP2868	CHP2869

Mark	No.	Description	DEH-1850/XN/ES	DEH-1850/XU/CN
	12	Carton	CHG5639	CHG5642
	13	Contain Box	CHL5639	CHL5642
	14	Protector	CHP2664	CHP2788
	15	Protector	CHP2868	CHP2869
	16-1	Owner's Manual	CRD4039	CRB2115
	16-2	Installation Manual	CRD4030	Not used
*	16-4	Warranty Card	Not used	ARY7046
	18	Case Assy	CXB3520	Not used



About the fixing screws for the front panel

If you do not operate the Detaching and Replacing the Front Panel Function, use the supplied fixing screws and fix the front panel to this unit.



Owner's Manual,Installation Manual

Part No.	Language
CRD4035	English, French, Spanish
CRD4028	English, French, Spanish
CRB2115	Casual Chinese

EXTERIOR(Page 8)

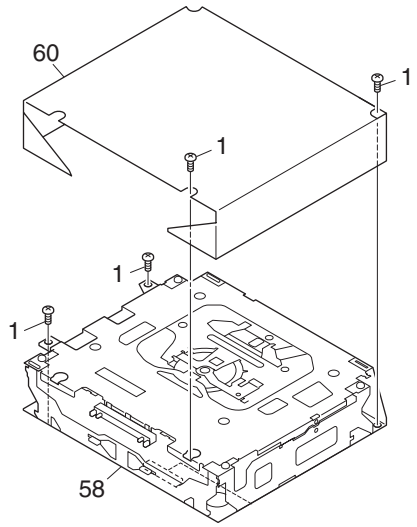
EXTERIOR SECTION PARTS LIST

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part.

Mark	No.	Description	DEH-1850/XN/ES	DEH-1800/XU/UC
	9	Tuner Amp Unit	CWN1271	CWN1269
⚠	13	Fuse(10 A)	CEK1208	YEK5001
	37	Detach Grille Assy	CXC5235	CXC5234
	40	Button(VOLUME(+/ -))	CAC9384	CAC9752
	45	Button(SOURCE,BAND)	CAC9383	CAC9751
	48	LCD	CAW1905	CAW1906
	56	Grille Unit	CXC5278	CXC5275
	58	CD Mechanism Module(S10.5)	CXK5701	CXK5700

Mark	No.	Description	DEH-1850/XN/ES	DEH-1850/XU/ES
⚠	13	Fuse(10 A)	CEK1208	YEK5001
	58	CD Mechanism Module(S10.5)	CXK5701	CXK5700

Mark	No.	Description	DEH-1850/XN/ES	DEH-1850/XU/CN
⚠	13	Fuse(10 A)	CEK1208	YEK5001
	37	Detach Grille Assy	CXC5235	CXC5236
	48	LCD	CAW1905	CAW1906
	58	CD Mechanism Module(S10.5)	CXK5701	CXK5700
	60	Sheet	Not used	CNM9404



CD MECHANISM MODULE(Page 10)

CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	DEH-1850/XN/ES	DEH-1800/XU/UC DEH-1850/XU/ES DEH-1850/XU/CN
	2	Connector(CN101)	CKS4182	CKS4808
	3	Connector(CN702)	CKS4185	CKS5283
	44	Roller	CNV7218	CNV8189
	48	Guide	CNV7799	CNV8448
	62	Collar	CNV8938	CNV8447

ELECTRICAL PARTS LIST(Page 34)

TUNER AMP UNIT

Circuit Symbol and No.	Part Name	DEH-1850/XN/ES	DEH-1800/XU/UC
⚠	Fuse(10 A)	CEK1208	YEK5001
R601		Not used	RS1/16S333J
R602		RS1/16S473J	RS1/16S333J

Circuit Symbol and No.	Part Name	DEH-1850/XN/ES	DEH-1850/XU/ES DEH-1850/XU/CN
⚠	Fuse(10 A)	CEK1208	YEK5001

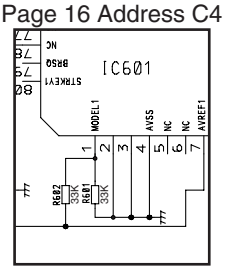
KEYBOARD UNIT

Circuit Symbol and No.	Part Name	DEH-1850/XN/ES	DEH-1800/XU/UC DEH-1850/XU/CN
	LCD	CAW1905	CAW1906

CD CORE UNIT(S10.5)

Circuit Symbol and No.	Part Name	DEH-1850/XN/ES	DEH-1800/XU/UC DEH-1850/XU/ES DEH-1850/XU/CN
C209		CKSRYB104K16	CKSRYB104K10
C238		CKSRYB104K16	CKSRYB104K10
C240		CKSRYB104K16	CKSRYB104K10

Page 16 Address C4



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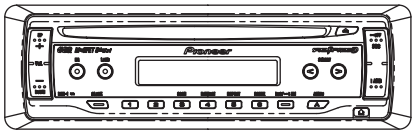
Service Manual



DEH-1850/XN/ES

ORDER NO.
CRT3552

HIGH POWER CD PLAYER WITH FM/AM TUNER

DEH-1850/XN/ES

This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech. Module	Remarks
CX-3166	CRT3582	S10.5STD	CD Mech. Module : Circuit Descriptions, Mech. Descriptions, Disassembly

For details, refer to "Important Check Points for Good Servicing".

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SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

● Service Precaution

1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.

COMPACT disc DIGITAL AUDIO

[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

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1. SPECIFICATIONS

General

Rated power source ..... 14.4 V DC
(allowable voltage range: 12.0 – 14.4 V DC)
Grounding system ..... Negative type
Max. current consumption
..... 10.0 A
Backup current ..... 5 mA or less
Dimensions (W × H × D):
DIN
Chassis ..... 178 × 50 × 157 mm
Nose ..... 188 × 58 × 20 mm
D
Chassis ..... 178 × 50 × 162 mm
Nose ..... 170 × 48 × 15 mm
Weight ..... 1.3 kg

Audio

Continuous power output ... 22 W × 4 (50 – 15 000 Hz, 5% THD, 4 Ω load, both channels driven)
Maximum power output ..... 50 W × 4
Load impedance ..... 4 Ω (4 – 8 Ω allowable)
Preout max output level/output impedance
..... 2.2 V/1 kΩ
Bass/Mid/Treble:
Bass
Frequency ..... 100 Hz
Gain ..... ±13dB
Mid
Frequency ..... 1 kHz
Gain ..... ±12dB
Treble
Frequency ..... 10 kHz
Gain ..... ±12dB
Loudness contour:
Low ..... +7 dB (100 Hz), +4 dB (10 kHz)
High ..... +10 dB (100 Hz), +6.5 dB (10 kHz)
(volume: –30 dB)

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format:
Sampling frequency ..... 44.1 kHz
Number of quantization bits
..... 16; linear
Frequency characteristics ... 5 – 20 000 Hz (±1 dB)
Signal-to-noise ratio ..... 94 dB (1 kHz) (IEC-A network)
Dynamic range ..... 92 dB (1 kHz)
Number of channels ..... 2 (stereo)

FM tuner

Frequency range ..... 87.5 – 108.0 MHz
Usable sensitivity ..... 8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity ..... 10 dBf (0.9 μV/75 Ω, mono)
Signal-to-noise ratio ..... 75 dB (IEC-A network)
Distortion ..... 0.3 % (at 65 dBf, 1 kHz, stereo)
0.1 % (at 65 dBf, 1 kHz, mono)
Frequency response ..... 30 – 15 000 Hz (±3 dB)
Stereo separation ..... 45 dB (at 65 dBf, 1 kHz)

AM tuner

Frequency range ..... 531 – 1 602 kHz (9 kHz)
530 – 1 640 kHz (10 kHz)
Usable sensitivity ..... 18 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

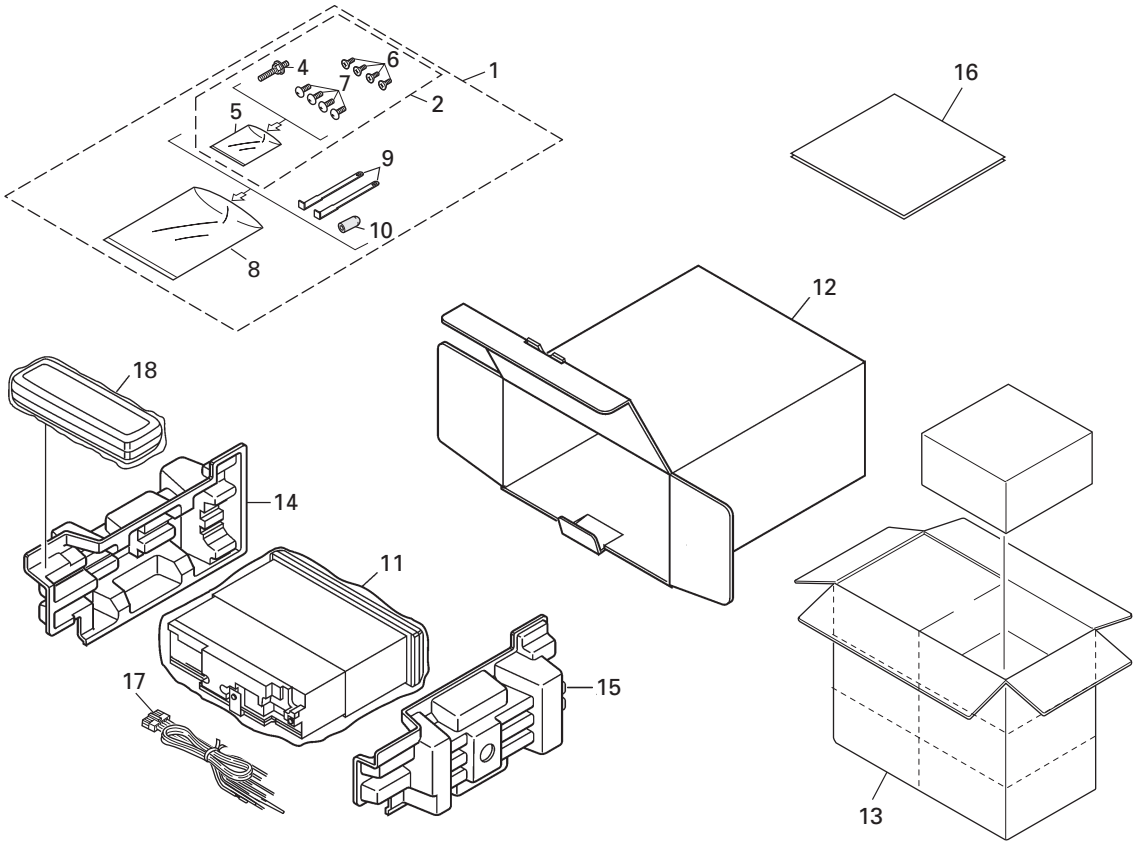
Note

Specifications and the design are subject to possible modifications without notice due to improvements. ▣

2. EXPLODED VIEWS AND PARTS LIST

*NOTES : • Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.*
• The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
• Screw adjacent to▽mark on the product are used for disassembly.
• For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions,apply as you think it appropriate.)

2.1 PACKING



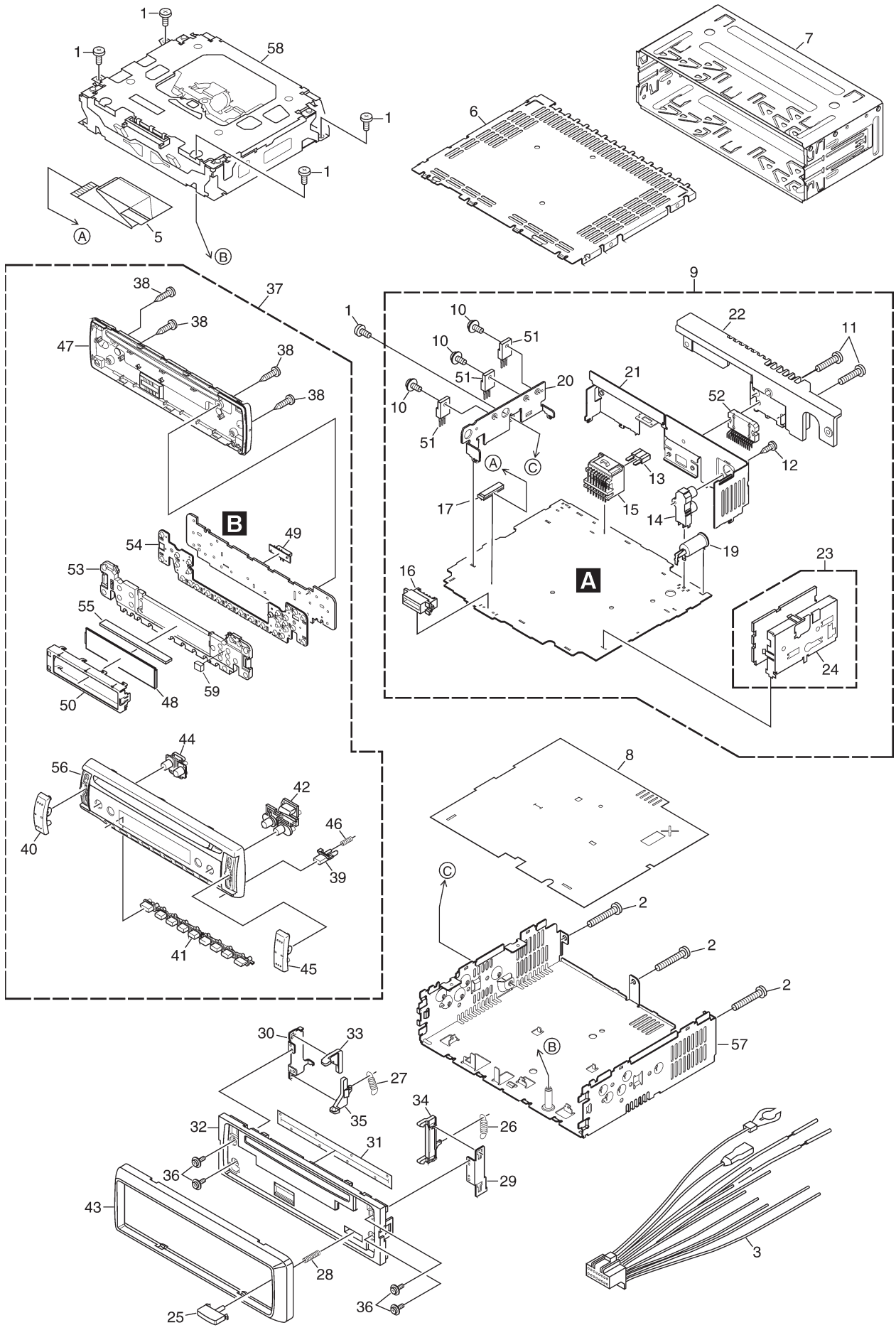
PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Accessory Assy	CEA4850
	2	Screw Assy	CEA3849
	3	•••••	
	4	Screw	CBA1650
*	5	Polyethylene Bag	CEG-127
	6	Screw	CRZ50P090FTC
	7	Screw	TRZ50P080FTC
*	8	Polyethylene Bag	CEG-158
	9	Handle	CNC5395
	10	Bush	CNV3930
	11	Polyethylene Bag	CEG-162
	12	Carton	CHG5639
	13	Contain Box	CHL5639
	14	Protector	CHP2664
	15	Protector	CHP2868
	16-1	Owner's Manual	CRD4039
	16-2	Installation Manual	CRD4030
	16-3	Caution Card	CRP1310
	17	Cord Assy	XDE7008
	18	Case Assy	CXB3520

Owner's Manual,Installation Manual

Part No.	Language
CRD4039	English, Spanish, Portuguese(B), Traditional Chinese, Arabic
CRD4030	English, Spanish, Portuguese(B), Traditional Chinese, Arabic

2.2 EXTERIOR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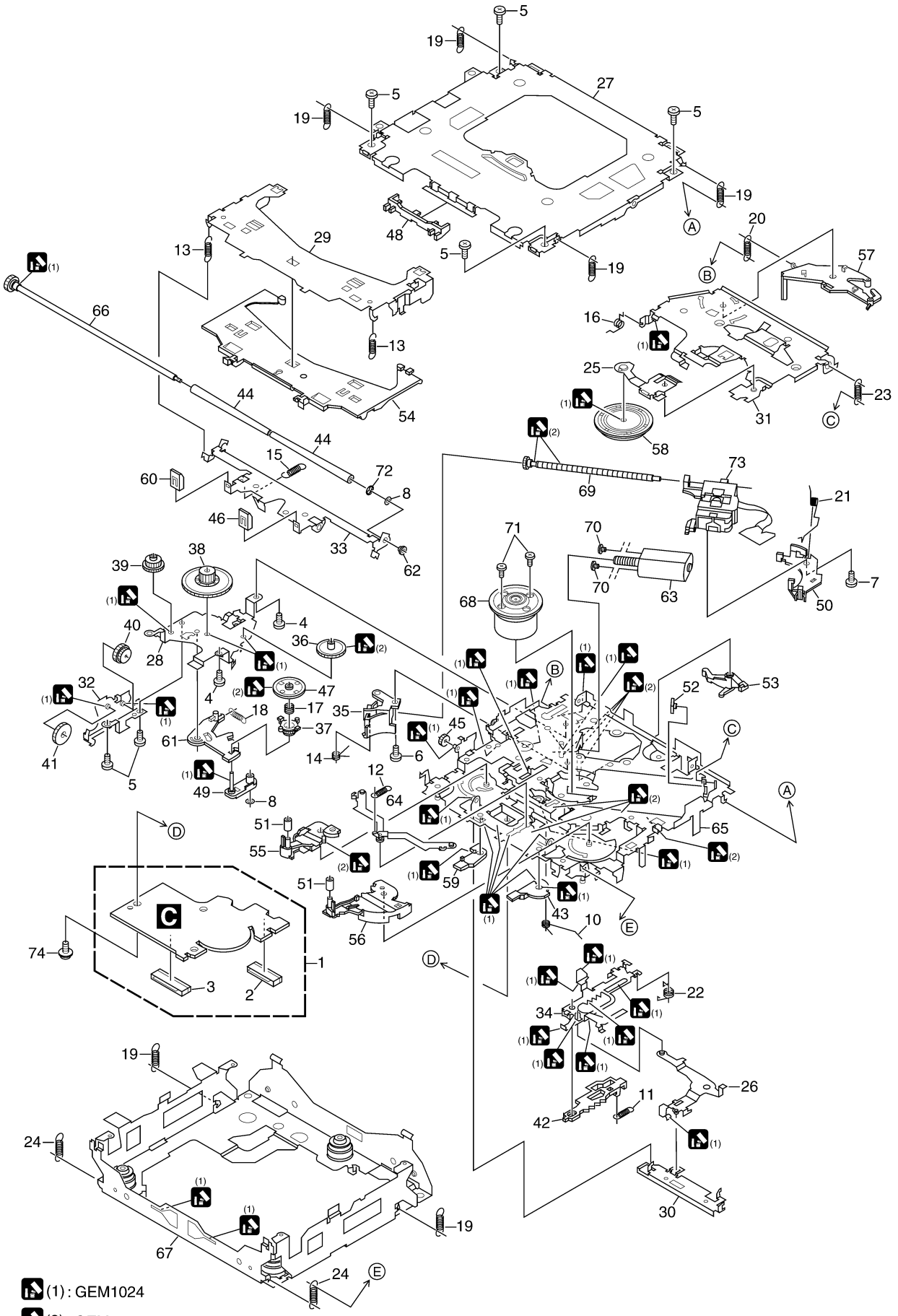
3
DEH-1850/XN/ES

EXTERIOR SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Screw	BSZ26P060FTC
	2	Screw	BSZ26P100FTC
	3	Cord Assy	XDE7008
	4	•••••	
	5	Cable	CDE7983
	6	Case	CNB2793
	7	Holder	CNC8659
	8	Insulator	CNM9145
	9	Tuner Amp Unit	CWN1271
	10	Screw	ASZ26P060FTC
	11	Screw	BMZ26P160FTC
	12	Screw	BPZ26P080FTC
⚠	13	Fuse(10 A)	CEK1208
	14	Pin Jack(CN352)	CKB1059
	15	Plug(CN901)	CKM1376
	16	Connector(CN831)	CKS3581
	17	Connector(CN651)	CKS3832
	18	•••••	
	19	Antenna Jack(CN401)	CKX1056
	20	Holder	CND2414
	21	Holder	CND2413
	22	Heat Sink	CNR1762
	23	FM/AM Tuner Unit	CWE1952
	24	Holder	CND1054
	25	Button(DETACH)	CAC4836
	26	Spring	CBH1835
	27	Spring	CBH2208
	28	Spring	CBH2367
	29	Bracket	CNC6791
	30	Holder	CNC8042
	31	Cover	CNM6276
	32	Panel	CNS8404
	33	Arm	CNV4692
	34	Arm	CNV4728
	35	Arm	CNV5576
	36	Screw	IMS20P030FTB
	37	Detach Grille Assy	CXC5235
	38	Screw	BPZ20P100FTB
	39	Button(DETACH)	CAC9382
	40	Button(VOLUME(+/ -))	CAC9384
	41	Button(CLOCK,1-6,LOCAL/BSM,AUDIO)	CAC9385
	42	Button(<, >EJECT)	CAC9389
	43	Panel	CNS8389
	44	Button(EQ,LOUDNESS)	CAC9390
	45	Button(SOURCE,BAND)	CAC9383
	46	Spring	CBH2210
	47	Cover	CNS8367
	48	LCD	CAW1905
	49	Connector(CN1801)	CKS3580
	50	Holder	CND2949
	51	Transistor(Q911,921,991)	2SD2396
	52	IC(IC302)	PAL007B
	53	Lighting Conductor	CNV8712
	54	Rubber	CNV8713
	55	Connector	CNV8714
	56	Grille Unit	CXC5278
	57	Chassis Unit	CXC3600
	58	CD Mechanism Module(S10.5)	CXK5701
	59	Spacer	CNN1238

2.3 CD MECHANISM MODULE

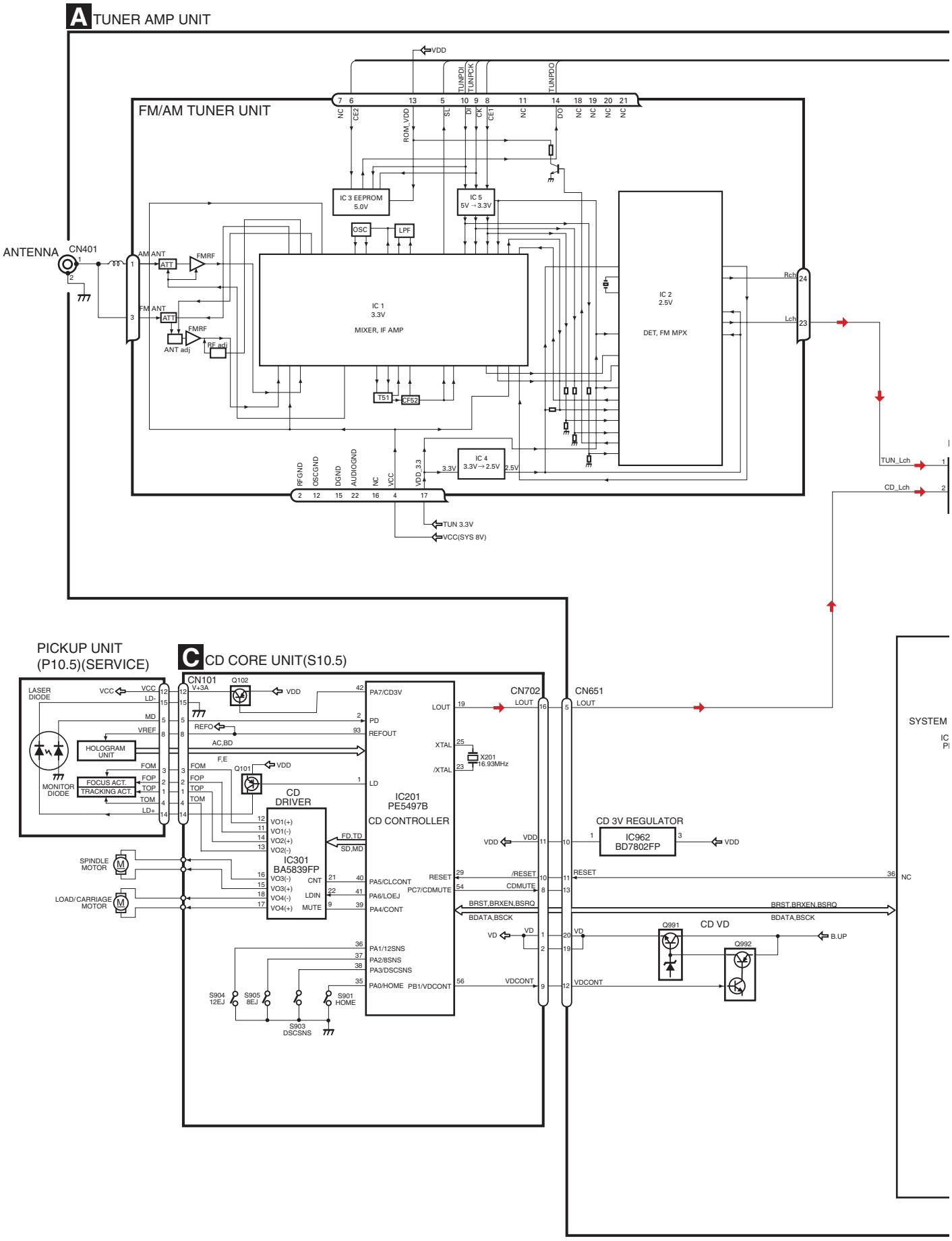


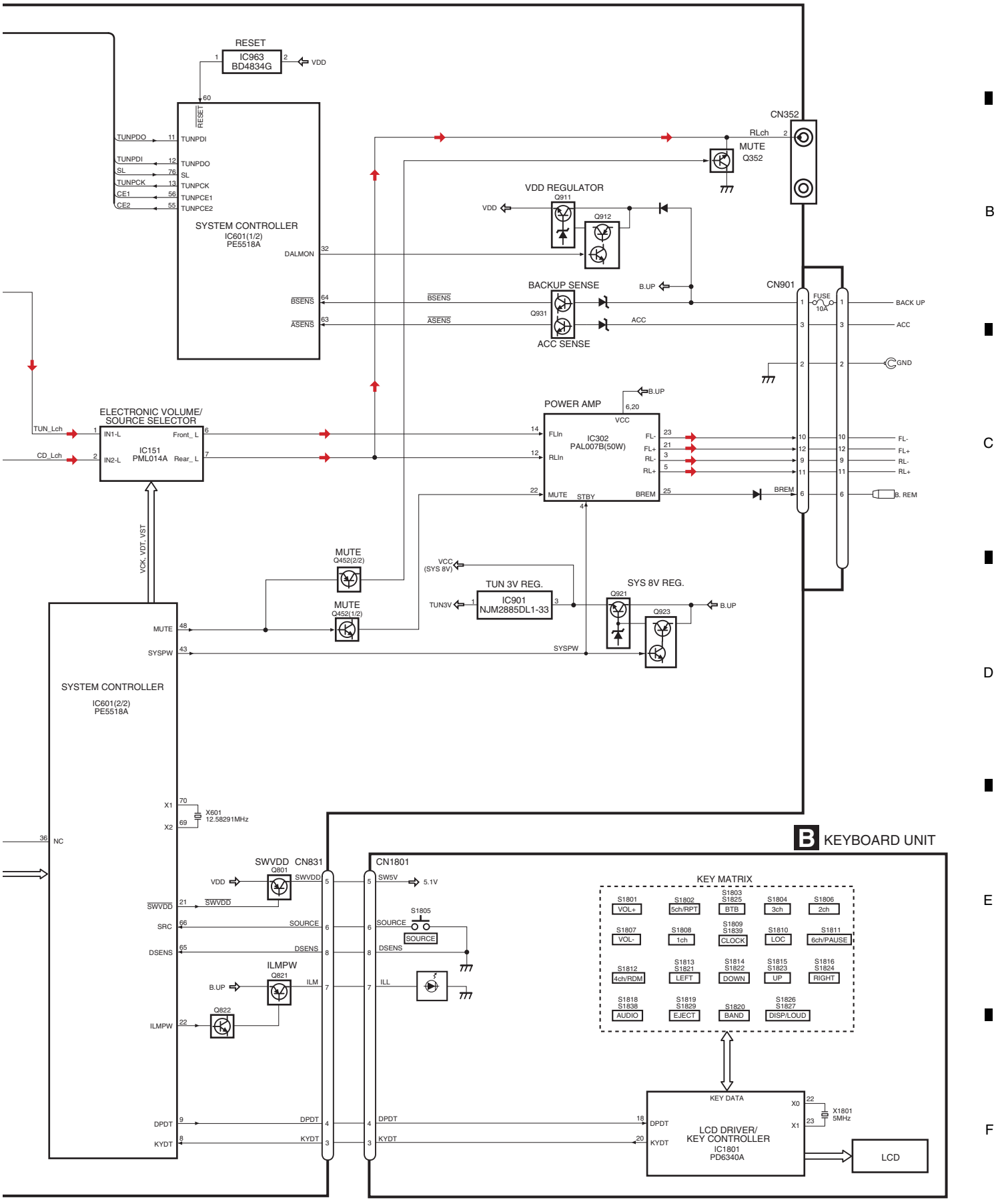
CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	CD Core Unit(S10.5)	CWX3090
	2	Connector(CN101)	CKS4182
	3	Connector(CN702)	CKS4185
	4	Screw	BMZ20P025FTC
	5	Screw	BSZ20P040FTC
	6	Screw(M2 x 3)	CBA1511
	7	Screw(M2 x 4)	CBA1835
	8	Washer	CBF1038
	9	•••••	
	10	Spring	CBH2609
	11	Spring	CBH2612
	12	Spring	CBH2614
	13	Spring	CBH2616
	14	Spring	CBH2617
	15	Spring	CBH2620
	16	Spring	CBH2855
	17	Spring	CBH2937
	18	Spring	CBH2735
	19	Spring	CBH2854
	20	Spring	CBH2642
	21	Spring	CBH2856
	22	Spring	CBH2857
	23	Spring	CBH2860
	24	Spring	CBH2861
	25	Spring	CBL1686
	26	Arm	CND1909
	27	Frame	CND2582
	28	Bracket	CND2583
	29	Arm	CND2584
	30	Lever	CND2585
	31	Arm	CND2586
	32	Bracket	CND2587
	33	Arm	CND2588
	34	Lever	CND2589
	35	Holder	CNV7201
	36	Gear	CNV7207
	37	Gear	CNV7208
	38	Gear	CNV7209
	39	Gear	CNV7210
	40	Gear	CNV7211
	41	Gear	CNV7212
	42	Rack	CNV7214
	43	Arm	CNV7216
	44	Roller	CNV7218
	45	Gear	CNV7219
	46	Guide	CNV7361
	47	Gear	CNV7595
	48	Guide	CNV7799
	49	Arm	CNV7805
	50	Rack	CNV8342
	51	Roller	CNV8343
	52	Holder	CNV8344
	53	Arm	CNV8345
	54	Guide	CNV8347
	55	Arm	CNV8348
	56	Arm	CNV8349
	57	Arm	CNV8350
	58	Clamper	CNV8365
	59	Arm	CNV8386
	60	Guide	CNV8396
	61	Arm	CNV8413
	62	Collar	CNV8938
	63	Motor Unit(M2)	CXC4026
	64	Arm Unit	CXC4027
	65	Chassis Unit	CXC4028
	66	Gear Unit	CXC4029
	67	Frame Unit	CXC4031
	68	Motor Unit(M1)	CXC6742
	69	Screw Unit	CXC6359
	70	Screw	JFZ20P020FTC
	71	Screw	JGZ17P022FTC
	72	Washer	YE20FTC
	73	Pickup Unit(P10.5)(Service)	CXX1942
	74	Screw	IMS26P030FTC

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

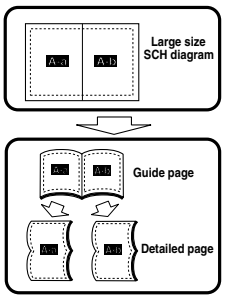
3.1 BLOCK DIAGRAM



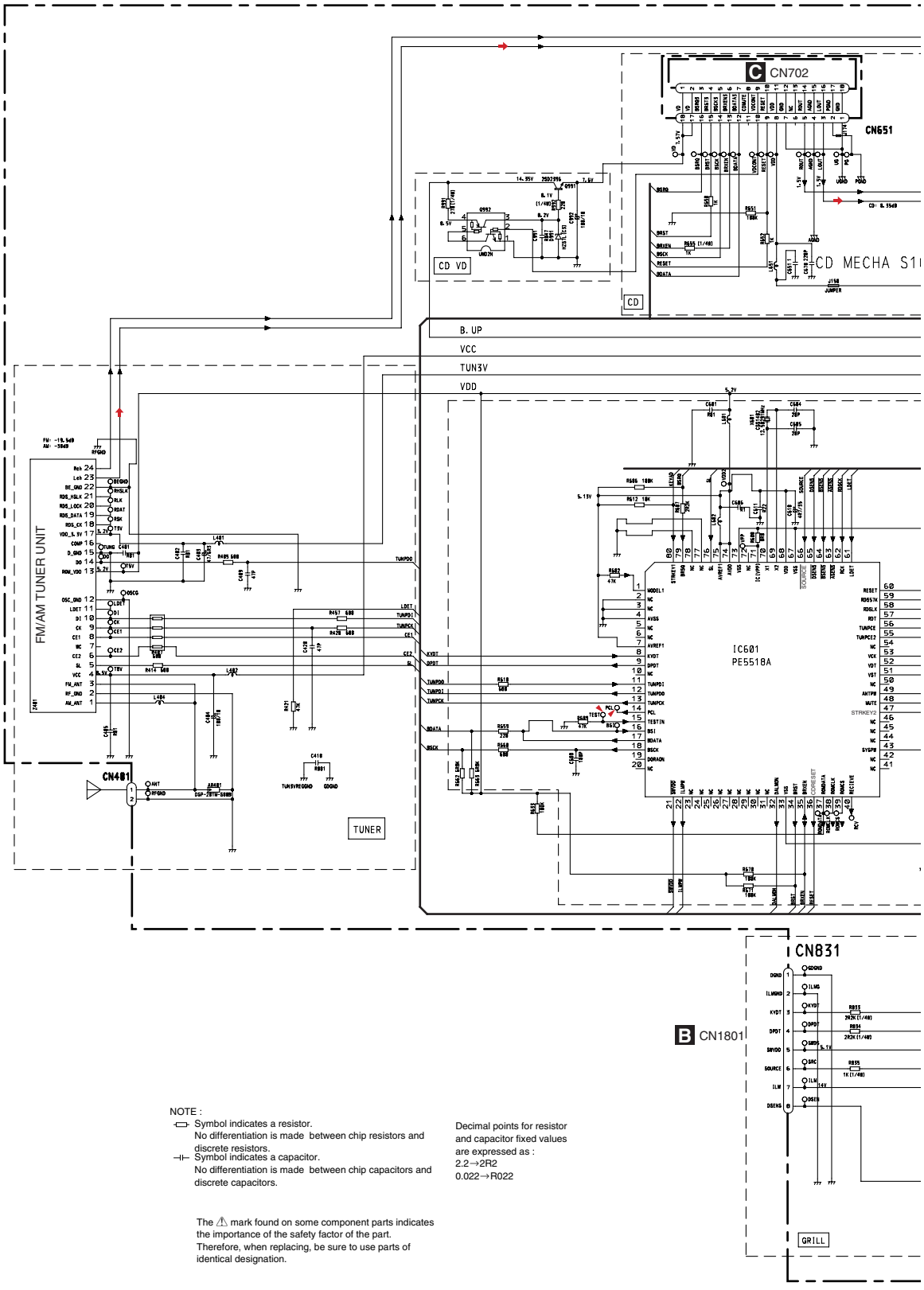

RESET
IC963
BD4834G
VDD
SYSTEM CONTROLLER
IC601(1/2)
PE5518A
TUNPDO
TUNPDI
SL
TUNPCK
CE1
CE2
TUNPCE1
TUNPCE2
DALMON
BSENS
ASENS
CN352
RLch
MUTE
Q352
VDD REGULATOR
Q911
Q912
BACKUP SENSE
Q931
ACC SENSE
B.UP
ACC
CN901
FUSE
10A
BACK UP
GND
ELECTRONIC VOLUME/
SOURCE SELECTOR
IC151
PML014A
TUN_Lch
CD_Lch
IN1-L
IN2-L
Front_ L
Rear_ L
POWER AMP
IC302
PAL007B(50W)
FLIn
RLIn
FL-
FL+
RL-
RL+
MUTE
STBY
BREM
B. REM
VCK, VDT, VST
MUTE
Q452(2/2)
Q452(1/2)
VCC
(SYS 8V)
TUN 3V REG.
IC901
NJM2885DL1-33
TUN3V
SYS 8V REG.
Q921
Q923
SYSPW
SYSTEM CONTROLLER
IC601(2/2)
PE5518A
X1
X2
X601
12.58291MHz
NC
SWVDD
CN831
Q801
SRC
SOURCE
DSENS
ILMPW
Q821
Q822
DPDT
KYDT
B KEYBOARD UNIT
CN1801
SW5V
5.1V
S1805
ILL
KEY MATRIX
S1801 VOL+
S1802 5ch/RPT
S1803 S1825 BTB
S1804 3ch
S1806 2ch
S1807 VOL-
S1808 1ch
S1809 S1839 CLOCK
S1810 LOC
S1811 6ch/PAUSE
S1812 4ch/RDM
S1813 S1821 LEFT
S1814 S1822 DOWN
S1815 S1823 UP
S1816 S1824 RIGHT
S1818 S1838 AUDIO
S1819 S1829 EJECT
S1820 BAND
S1826 S1827 DISP/LOUD
KEY DATA
LCD DRIVER/
KEY CONTROLLER
IC1801
PD6340A
X1801
5MHz
LCD

3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to " EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".



A-a



NOTE :
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

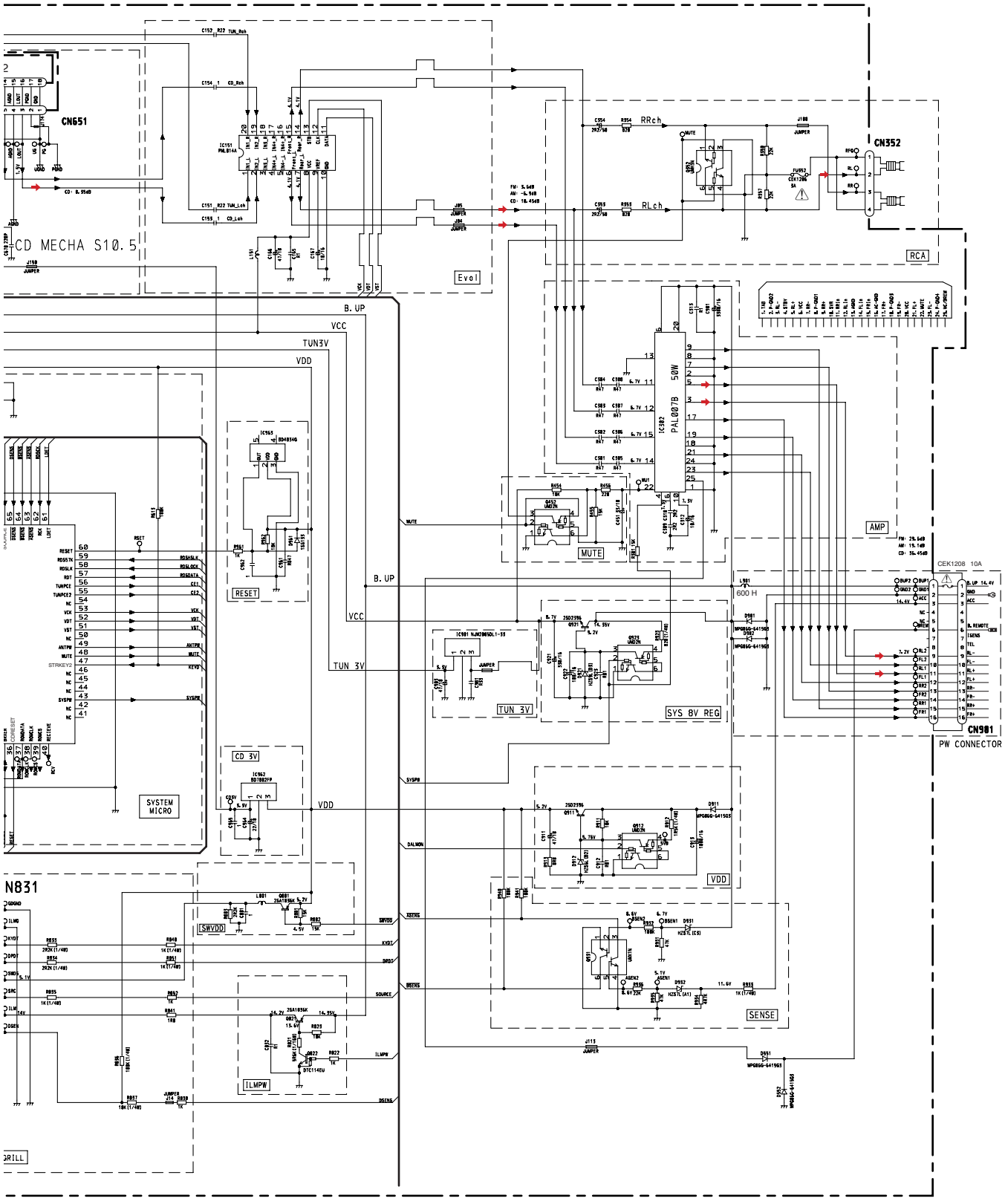
Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

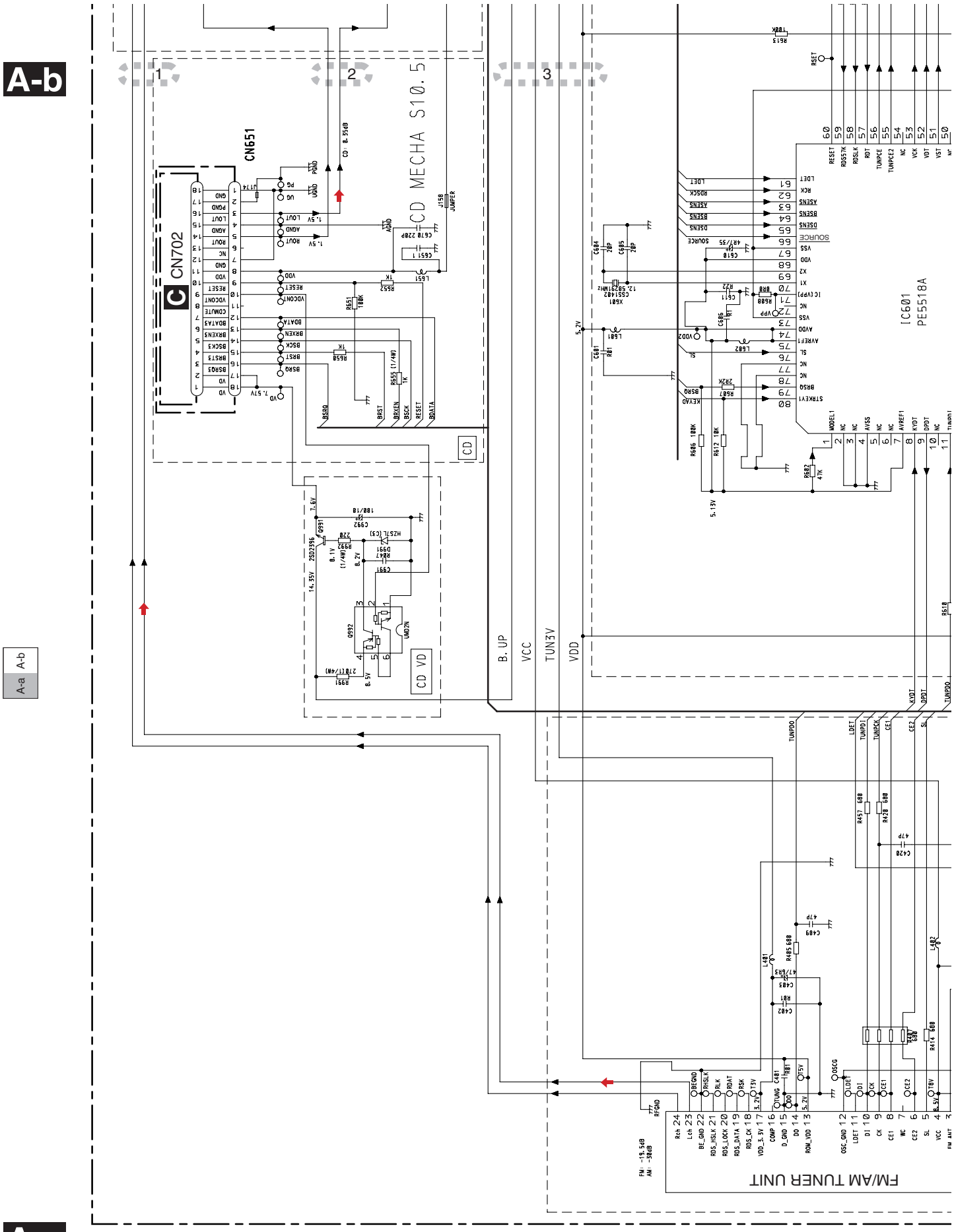
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

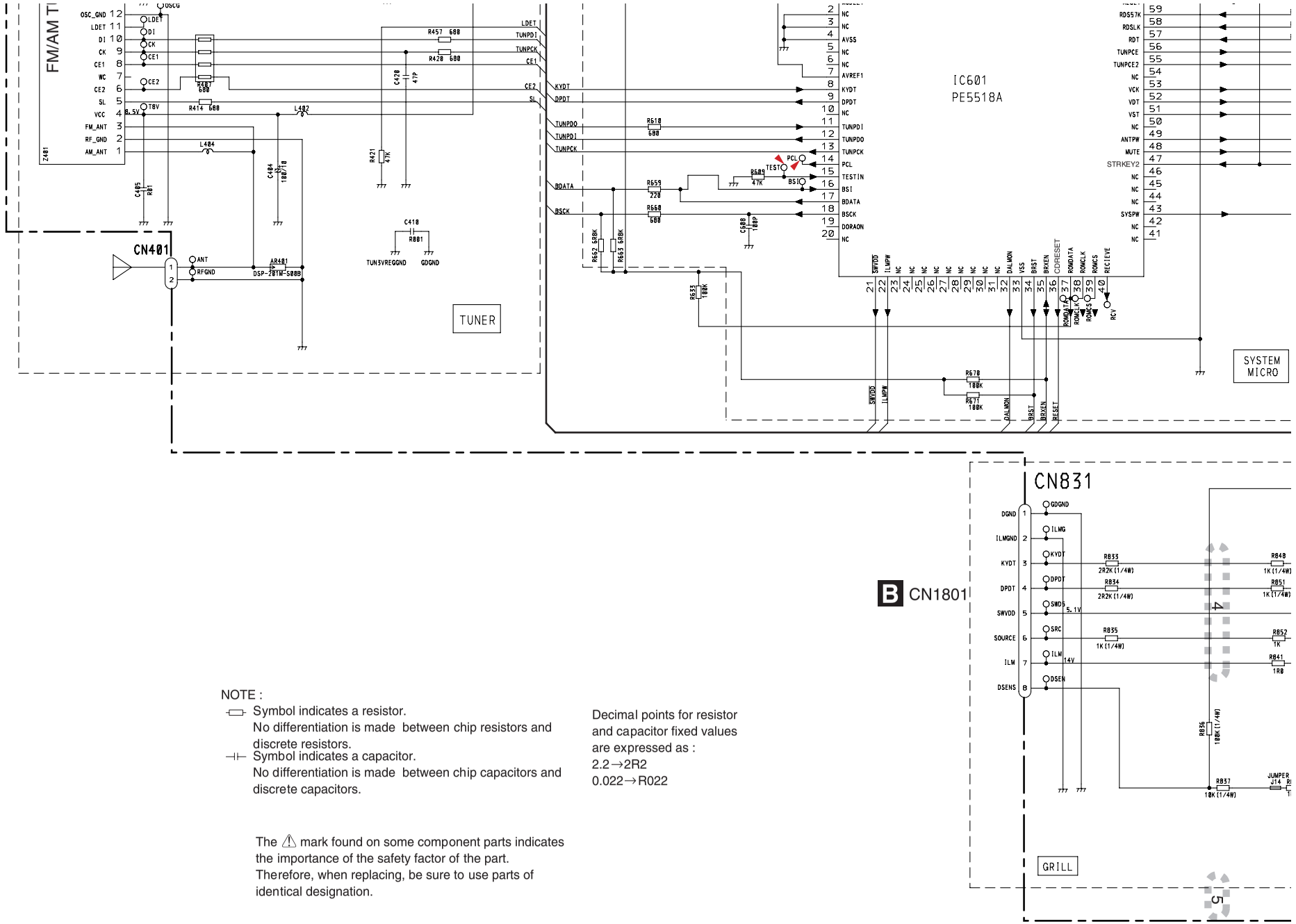
A

A-b

A TUNER AMP UNIT




A-b
A-a
CD MECHA S10.5
CN651
CN702
CD
CD VD
B.UP
VCC
TUN3V
VDD
IC601
PE5518A
FM/AM TUNER UNIT

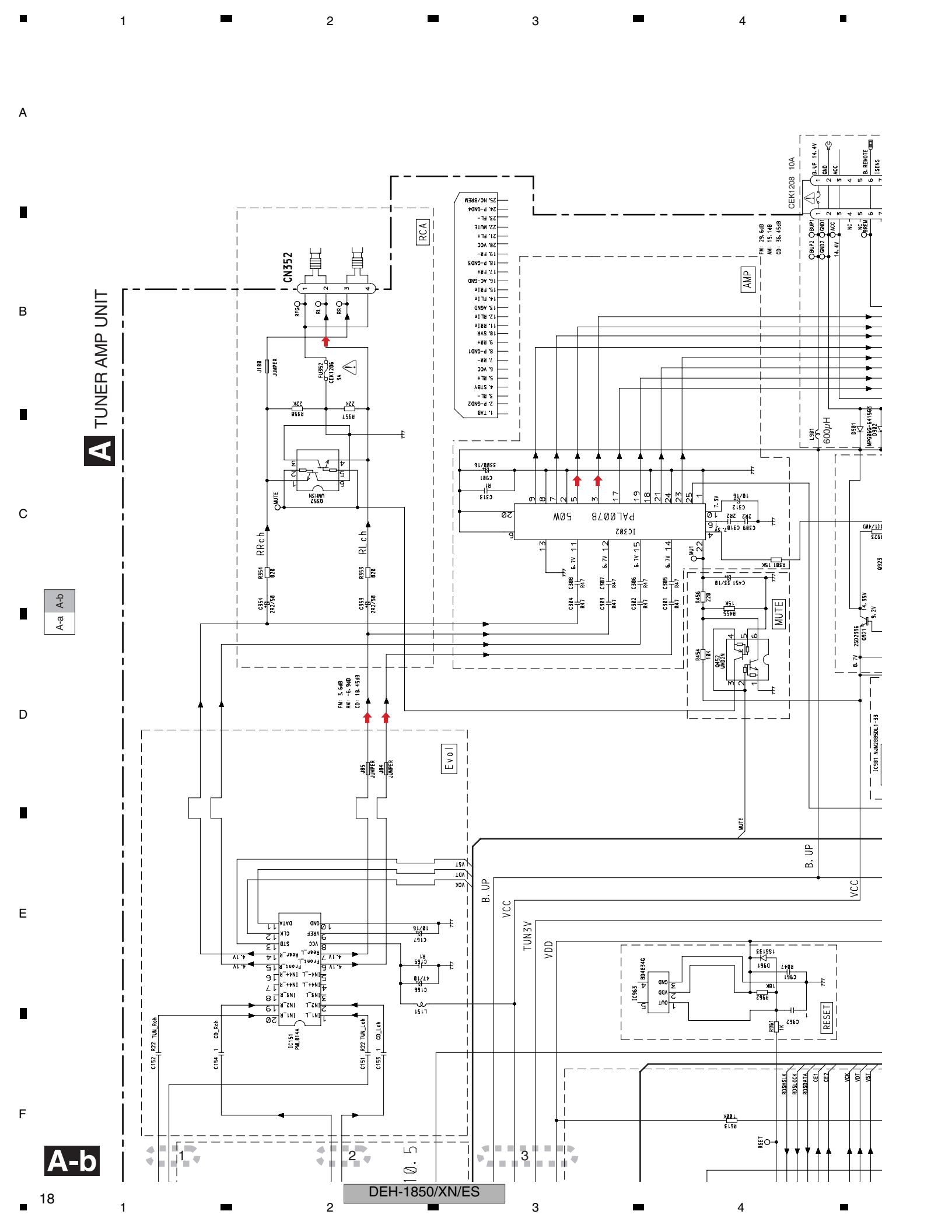


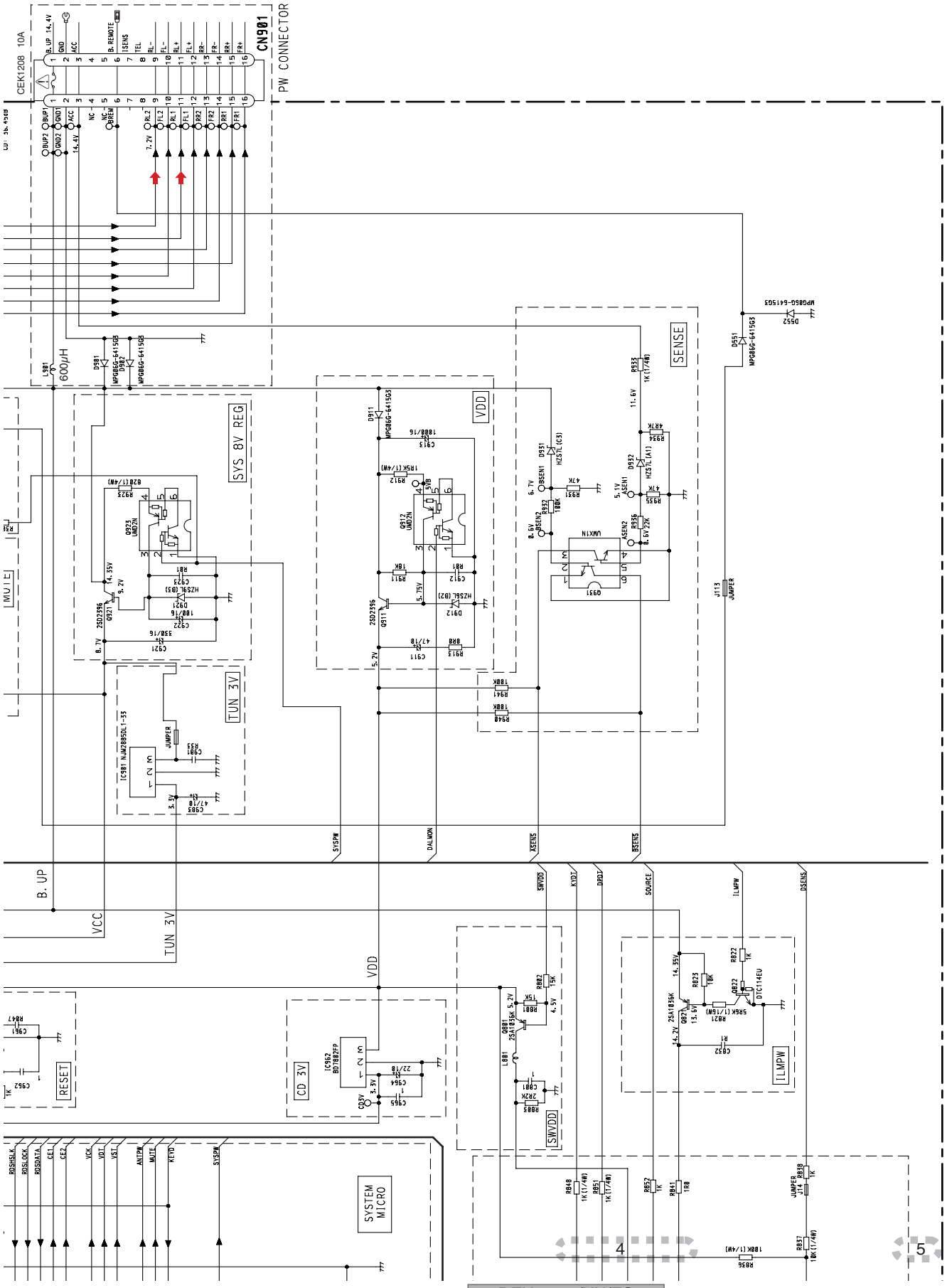
NOTE :

- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

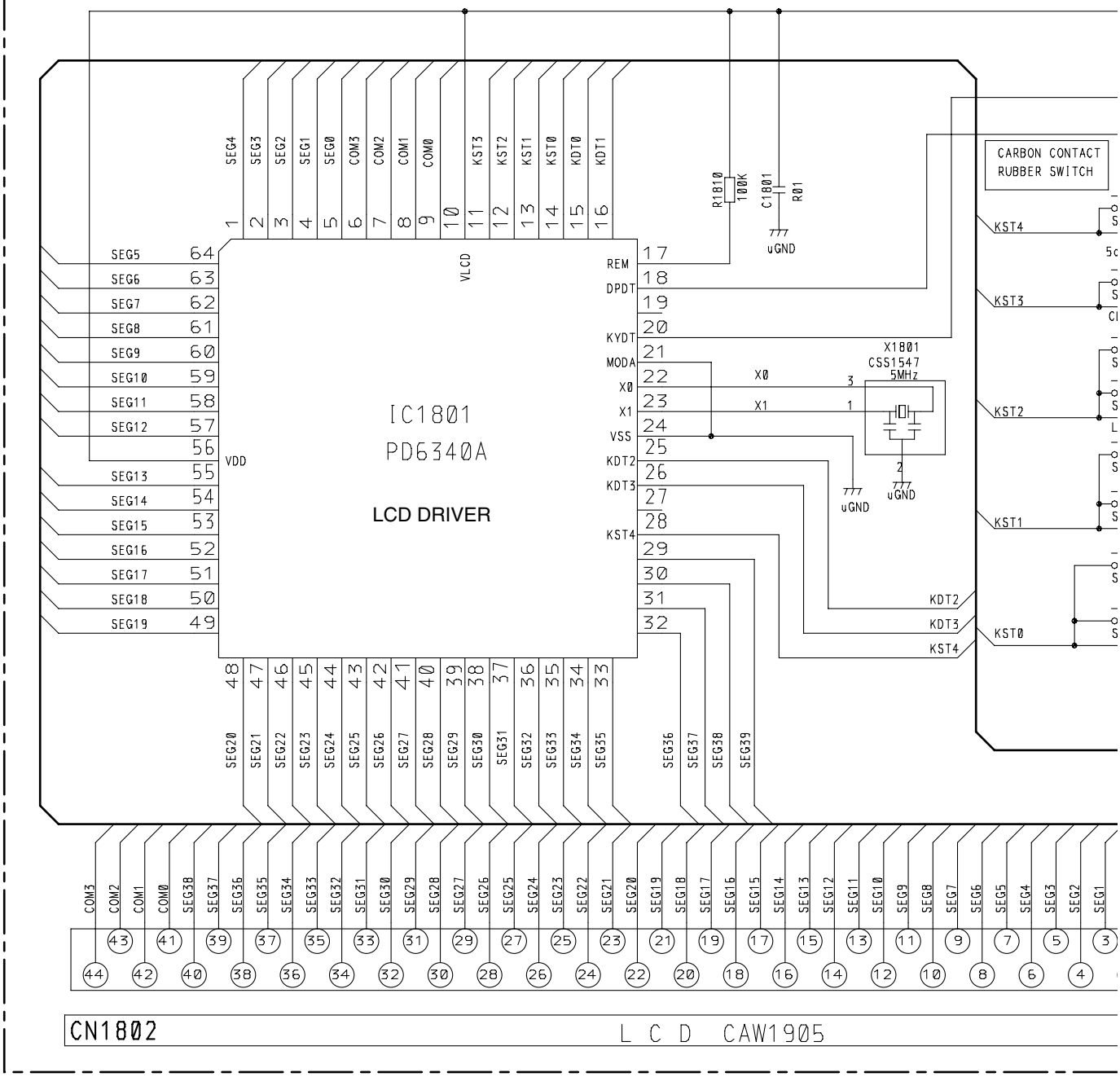
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

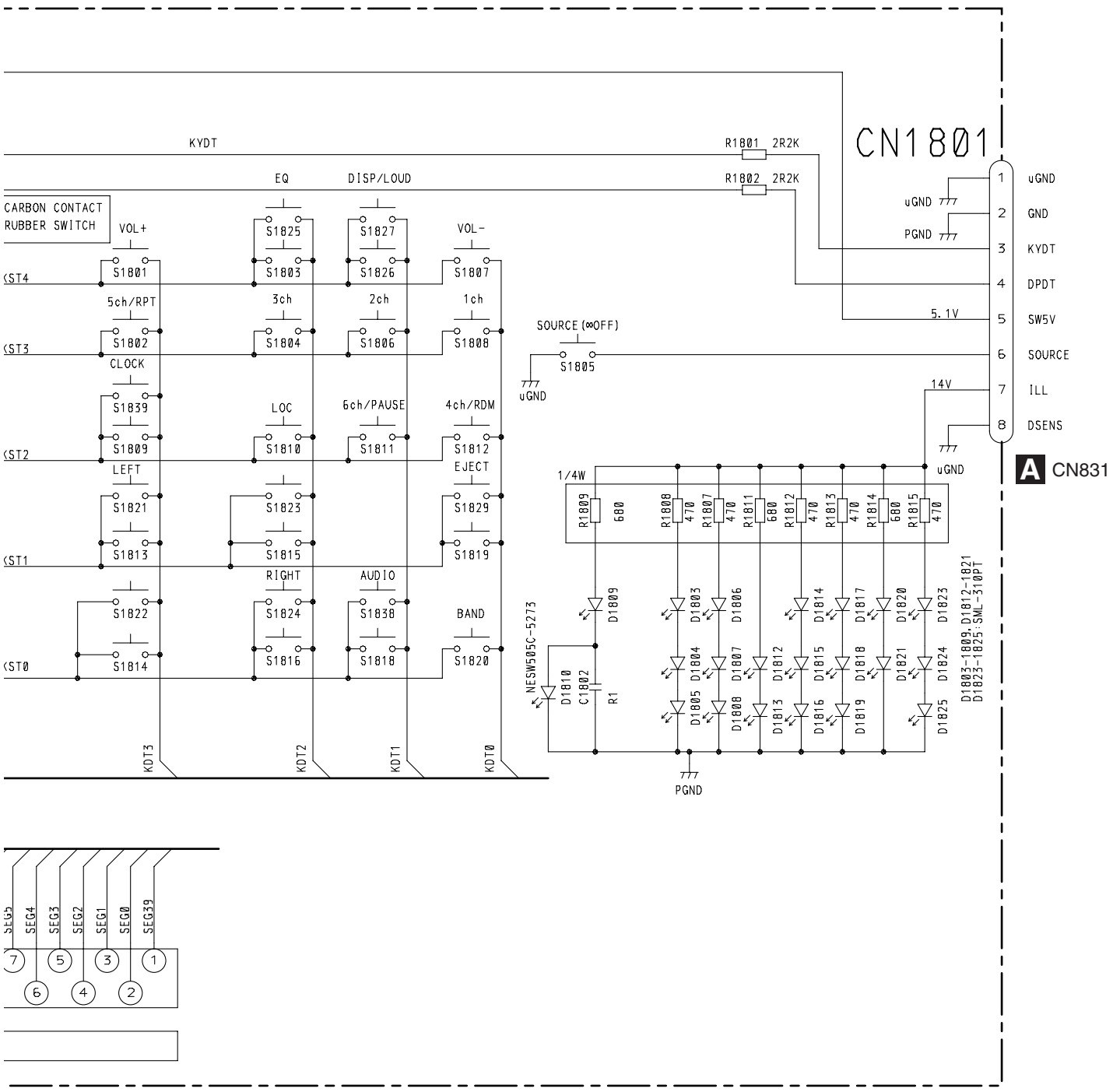

A TUNER AMP UNIT
RCA
CN352
AMP
MUTE
RRch
RLch
PAL007B 50W
IC302
CEK1208 10A
Evol
IC151 PWL814A
IC901 NJM2885DL1-33
IC963 BD48346
RESET
B. UP
VCC
TUN3V
VDD
A-b
10.5


CEK1208 10A
CN901
PW CONNECTOR
B.UP 14.4V
GND
ACC
B.REMOTE
ISENS
TEL
RL-
FL-
RL+
FL+
RR-
FR-
RR+
FR+
BUP1
BUP2
GND1
GND2
NC
RL2
RL1
FL1
FR2
FR1
600μH
SYS 8V REG
VDD
SENSE
MUTE
TUN 3V
RESET
CD 3V
SWVDD
ILMPW
SYSTEM MICRO
B. UP
VCC
TUN 3V
VDD
SYSPW
DALMON
ASENS
KEYD
SOURCE
RDSHSLK
RDSLOCK
RDSDATA
CE1
CE2
VCK
VDT
VST
ANTPW
MUTE
4
5
A-b
DEH-1850/XN/ES
19

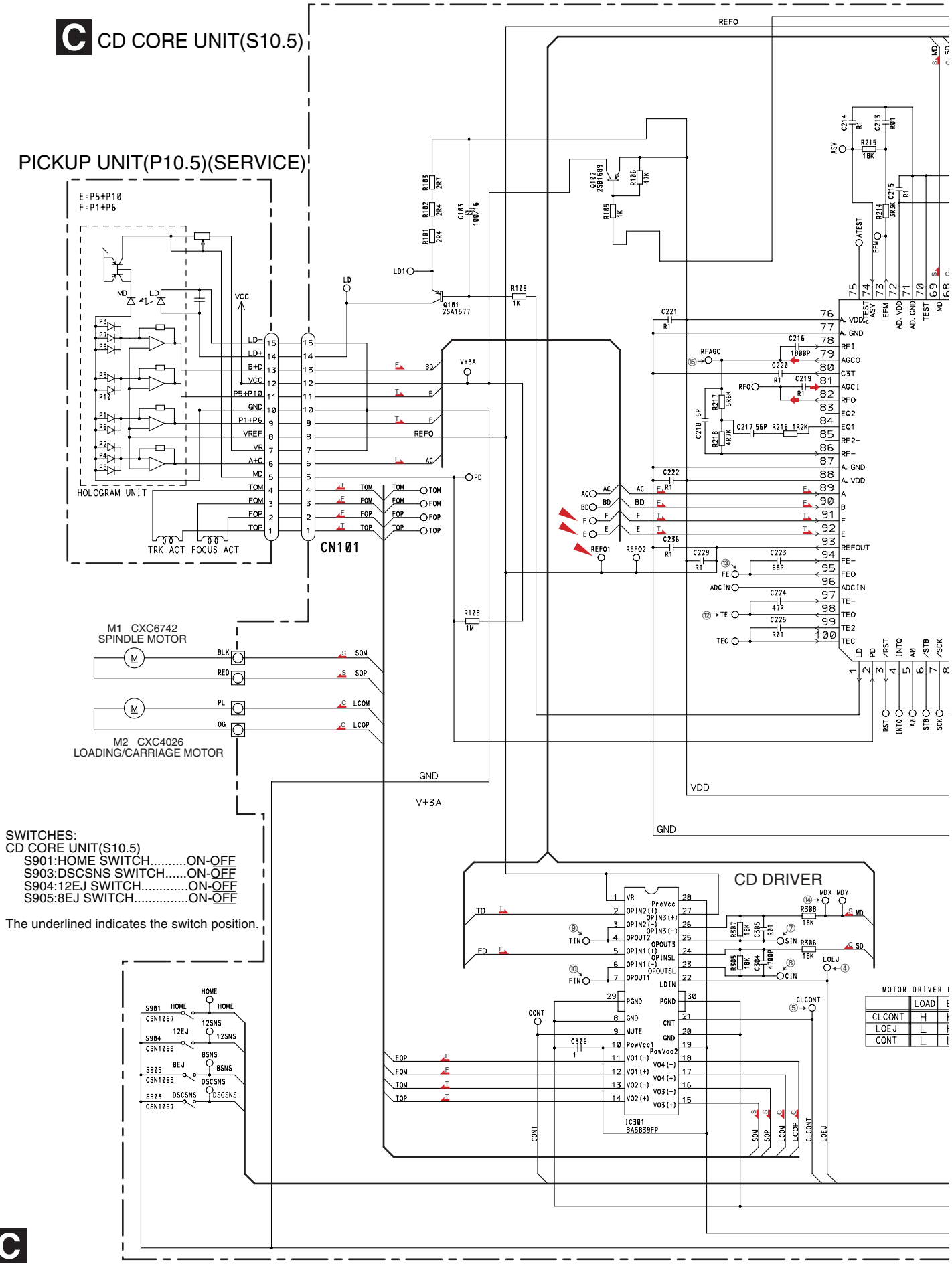
3.3 KEYBOARD UNIT

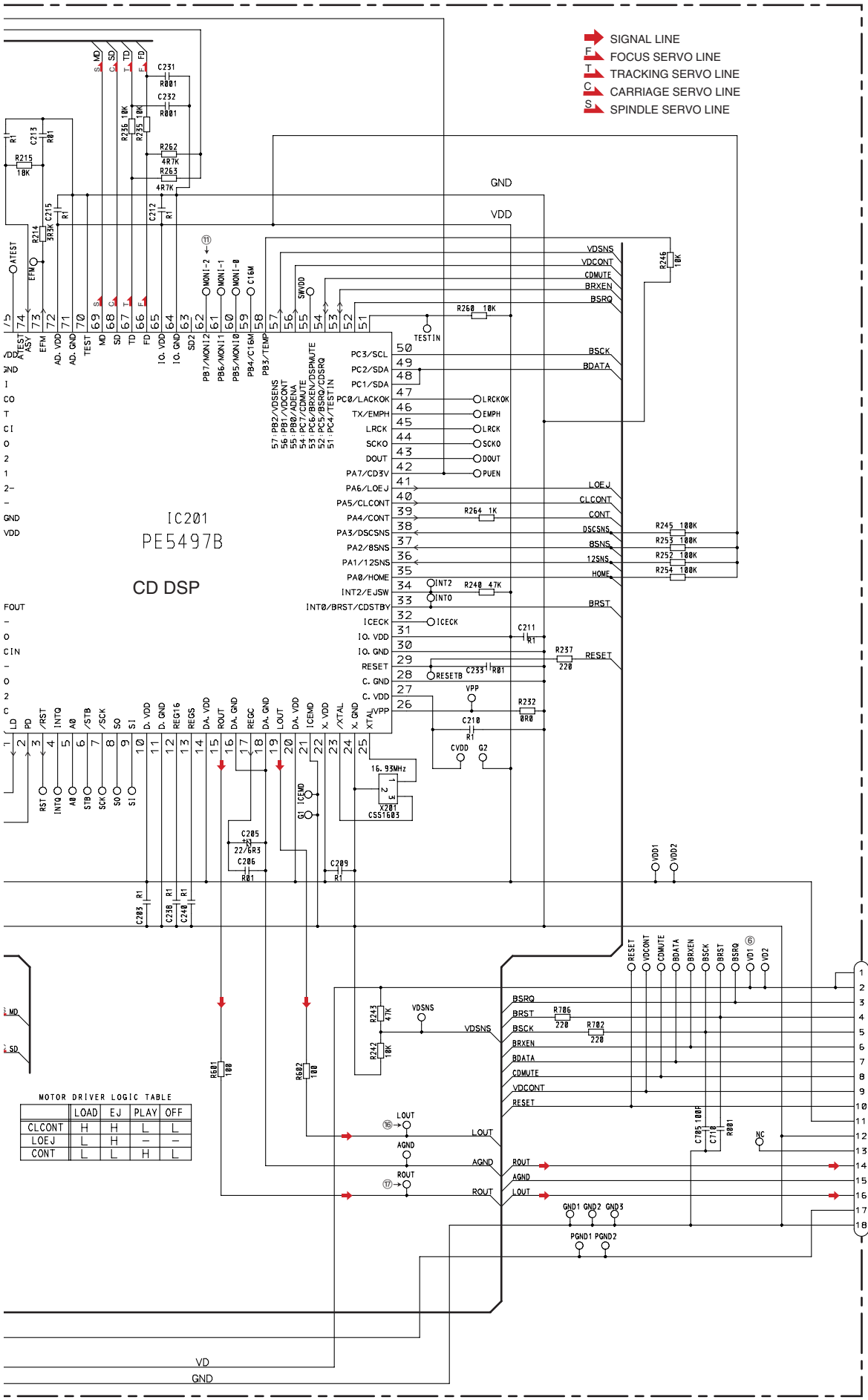
B KEYBOARD UNIT




CN1801
KYDT
R1801 2R2K
R1802 2R2K
EQ
DISP/LOUD
CARBON CONTACT
RUBBER SWITCH
VOL+
VOL-
5ch/RPT
3ch
2ch
1ch
CLOCK
LOC
6ch/PAUSE
4ch/RDM
LEFT
EJECT
RIGHT
AUDIO
BAND
S1801
S1802
S1803
S1804
S1805
S1806
S1807
S1808
S1809
S1810
S1811
S1812
S1813
S1814
S1815
S1816
S1818
S1819
S1820
S1821
S1822
S1823
S1824
S1825
S1826
S1827
S1829
S1838
SOURCE(∞OFF)
uGND
PGND
5.1V
14V
1 uGND
2 GND
3 KYDT
4 DPDT
5 SW5V
6 SOURCE
7 ILL
8 DSENS
A CN831
1/4W
R1809 680
R1808 470
R1807 470
R1811 680
R1812 470
R1813 470
R1814 680
R1815 470
D1809
D1803
D1806
D1814
D1817
D1820
D1823
D1804
D1807
D1812
D1815
D1818
D1821
D1824
D1805
D1808
D1813
D1816
D1819
D1825
D1803-1809,D1812-1821
D1823-1825:SML-310PT
NESW505C-5273
D1810
C1802
R1
KDT3
KDT2
KDT1
KDT0
ST4
ST3
ST2
ST1
ST0
SEG5
SEG4
SEG3
SEG2
SEG1
SEG0
SEG39
7
5
3
1
6
4
2
B

3.4 CD MECHANISM MODULE



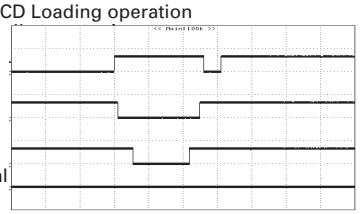

SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE
IC201
PE5497B
CD DSP
16.93MHz
X201
CSS1603
CN702
Aout
CN651
MOTOR DRIVER LOGIC TABLE
LOAD EJ PLAY OFF
CLCONT H H L L
LOEJ L H – –
CONT L L H L
VD
GND

● Waveforms

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65 V)

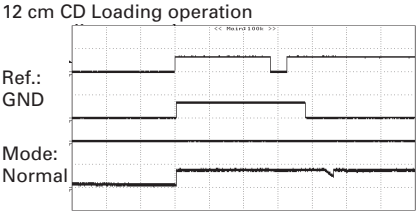
① DSCSNS 5 V/div		500 ms/div
② 8SNS 5 V/div		
③ 12SNS 5 V/div		
④ LOEJ 5 V/div		

12 cm CD Loading operation



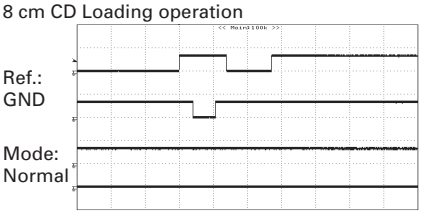
① DSCSNS 5 V/div		500 ms/div
⑤ CLCONT 5 V/div		
④ LOEJ 5 V/div		
⑥ VD 10 V/div		

12 cm CD Loading operation



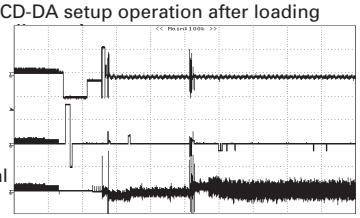
① DSCSNS 5 V/div		500 ms/div
② 8SNS 5 V/div		
③ 12SNS 5 V/div		
④ LOEJ 5 V/div		

8 cm CD Loading operation



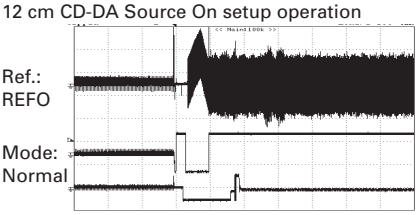
⑦ SIN 1 V/div		2 s/div
⑧ CIN 500 mV/div		
⑨ TIN 500 mV/div		

12 cm CD-DA setup operation after loading



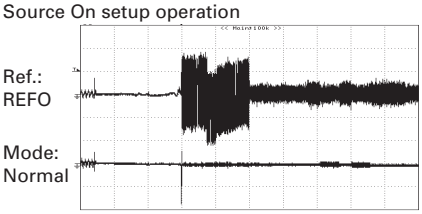
⑩ FIN 200 mV/div		500 ms/div
⑪ RFOK (MONI_2) 2 V/div		
⑦ SIN 2 V/div		

12 cm CD-DA Source On setup operation



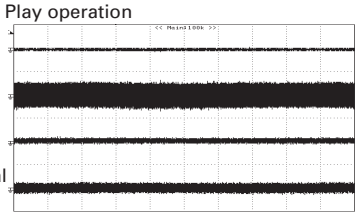
⑫ TE 500 mV/div		200 ms/div
⑬ FE 500 mV/div		

Source On setup operation



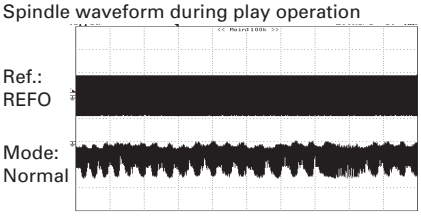
⑬ FE 500 mV/div		20 ms/div
⑩ FIN 500 mV/div		
⑫ TE 500 mV/div		
⑨ TIN 500 mV/div		

CD-DA Play operation



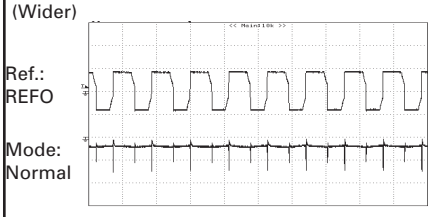
⑭ MDX 2 V/div		50 ms/div
⑦ SIN 500 mV/div		

Spindle waveform during play operation



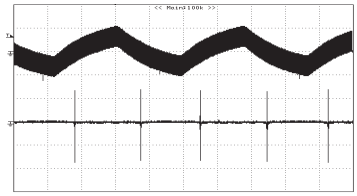
⑭ MDX 2 V/div		5 µs/div
⑦ SIN 500 mV/div		

Spindle waveform during play operation (Wider)



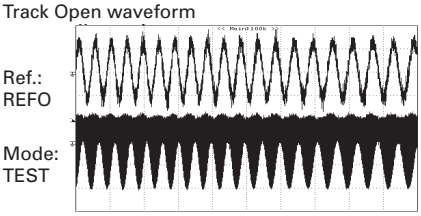
⑩ FIN 500 mV/div		200 ms/div
⑬ FE 500 mV/div		

Focus Search waveform



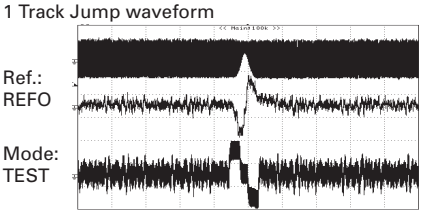
⑫ TE 500 mV/div		2 ms/div
⑮ RFAGC 500 mV/div		

Track Open waveform



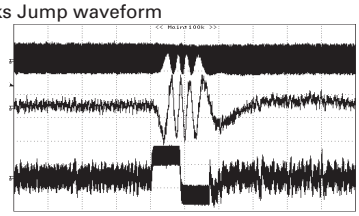
⑮ RFAGC 1 V/div		500 µs/div
⑫ TE 500 mV/div		
⑨ TIN 500 mV/div		

1 Track Jump waveform



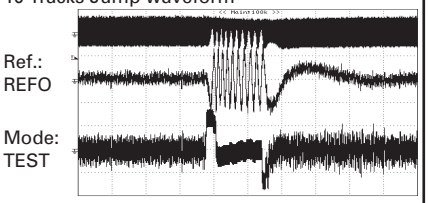
⑮ RFAGC	1 V/div	500 µs/div
⑫ TE	500 mV/div	
⑨ TIN	500 mV/div	

4 Tracks Jump waveform



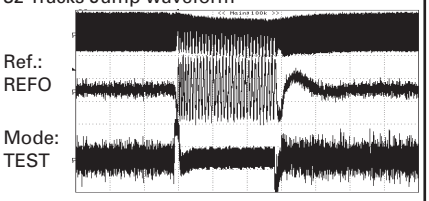
⑮ RFAGC	1 V/div	1 ms/div
⑫ TE	500 mV/div	
⑨ TIN	500 mV/div	

10 Tracks Jump waveform



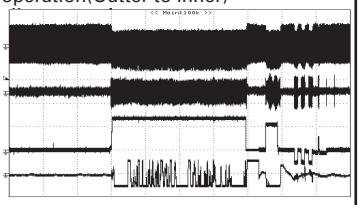
⑮ RFAGC	1 V/div	2 ms/div
⑫ TE	500 mV/div	
⑨ TIN	500 mV/div	

32 Tracks Jump waveform



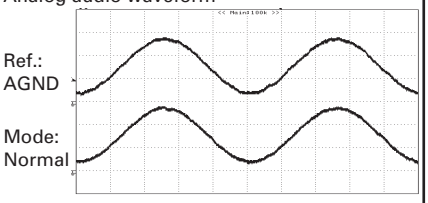
⑮ RFAGC	1 V/div	200 ms/div
⑫ TE	1 V/div	
⑧ CIN	500 mV/div	
⑦ SIN	2 V/div	

Search operation(Outter to Inner)



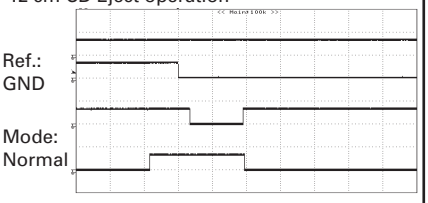
⑯ LOUT	1 V/div	200 µs/div
⑰ ROUT	1 V/div	

Analog audio waveform



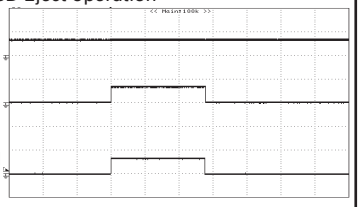
① DSCSNS	5 V/div	500 ms/div
② 8SNS	5 V/div	
③ 12SNS	5 V/div	
④ LOEJ	5 V/div	

12 cm CD Eject operation



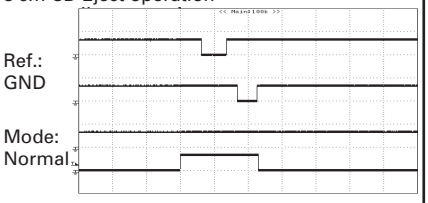
① DSCSNS	5 V/div	500 ms/div
⑤ CLCONT	5 V/div	
④ LOEJ	5 V/div	

12 cm CD Eject operation



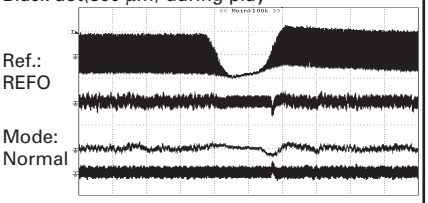
① DSCSNS	5 V/div	500 ms/div
② 8SNS	5 V/div	
③ 12SNS	5 V/div	
④ LOEJ	5 V/div	

8 cm CD Eject operation



⑮ RFAGC	1 V/div	500 µs/div
⑨ TIN	1 V/div	
⑫ TE	1 V/div	
⑩ FIN	1 V/div	

Black dot(800 µm) during play

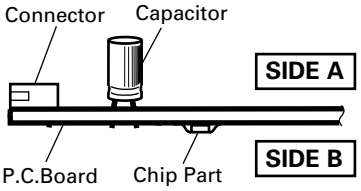


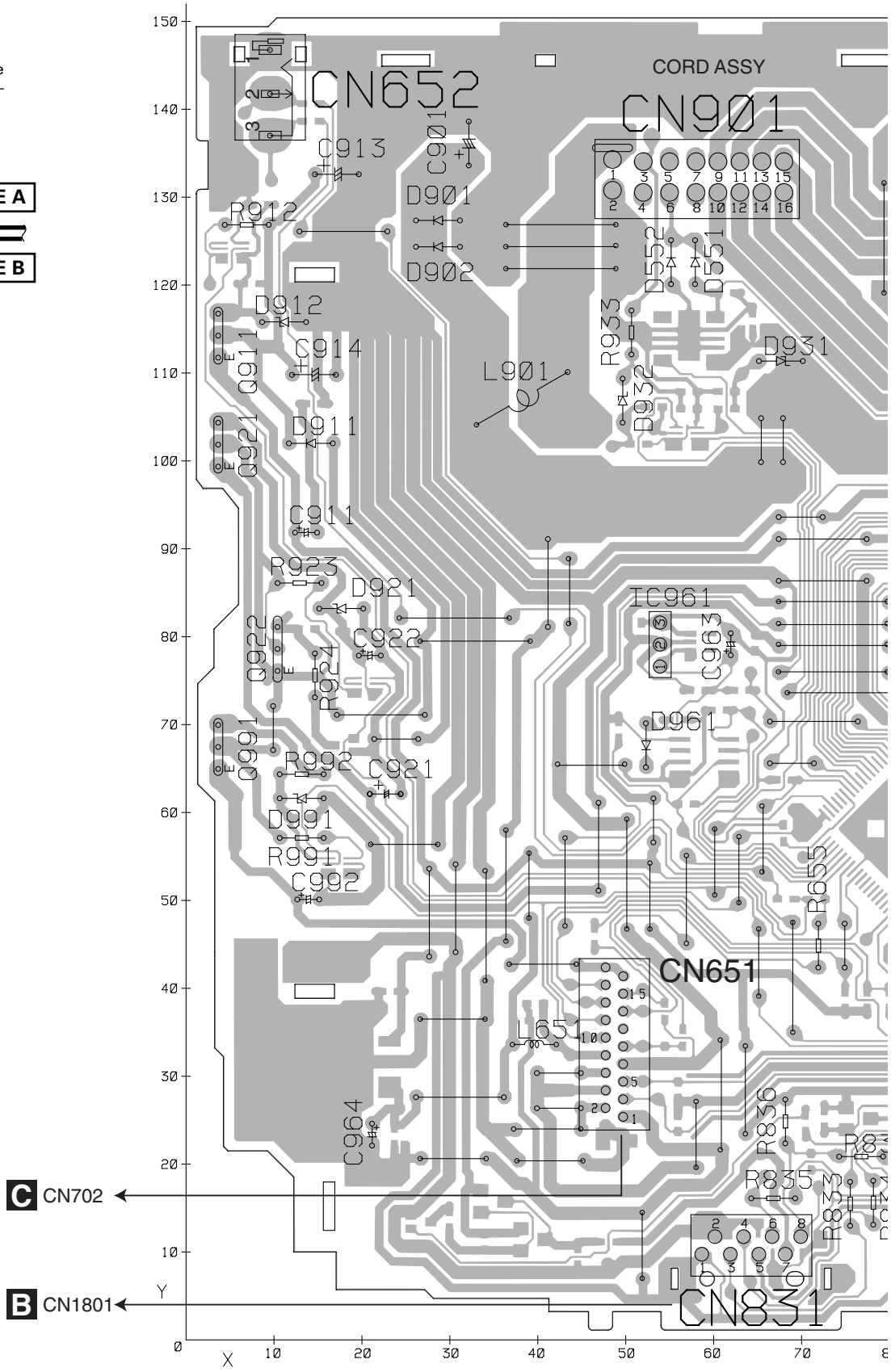
4. PCB CONNECTION DIAGRAM
4.1 TUNER AMP UNIT

A TUNER AMP UNIT

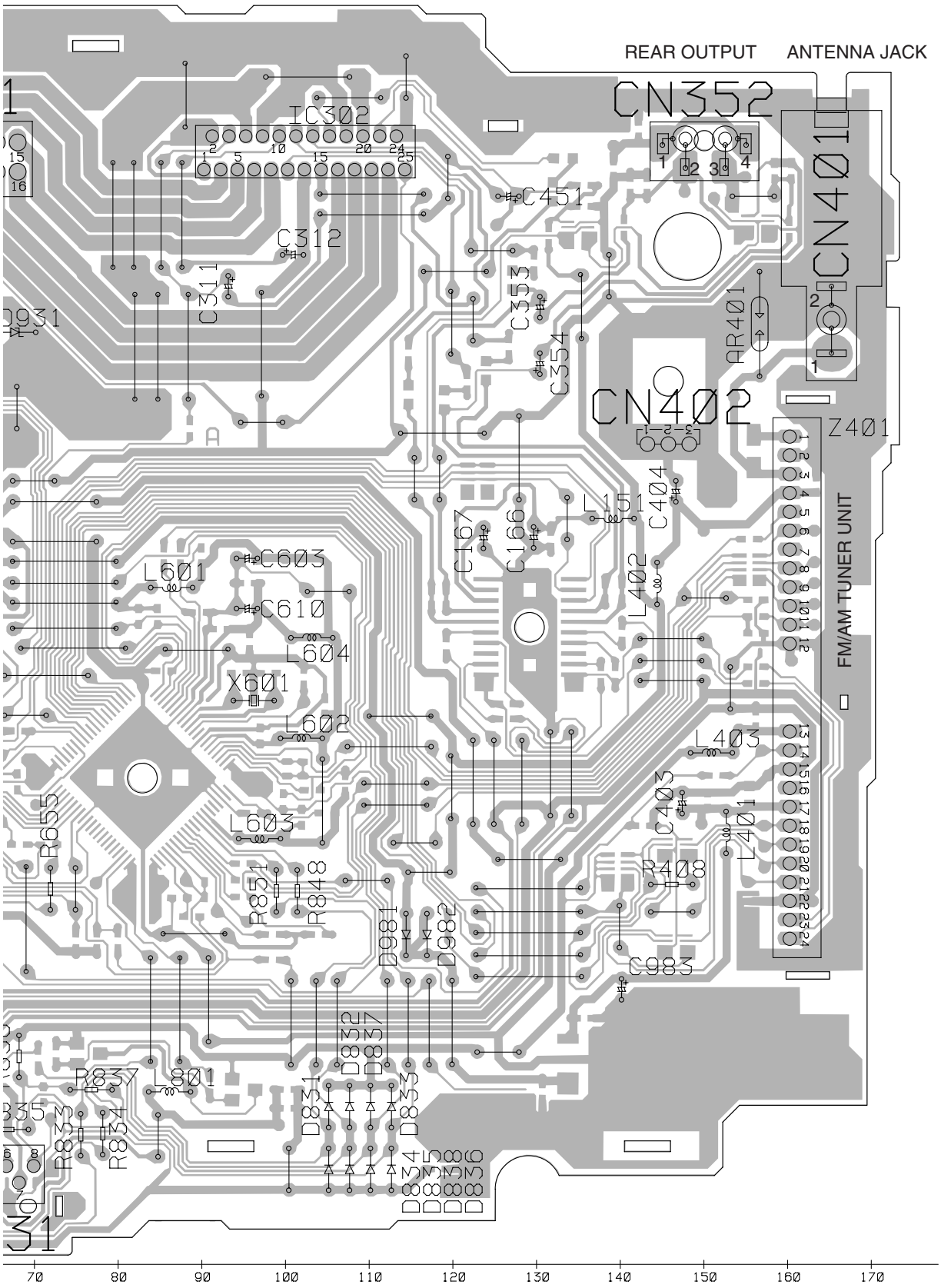
NOTE FOR PCB DIAGRAMS

1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams

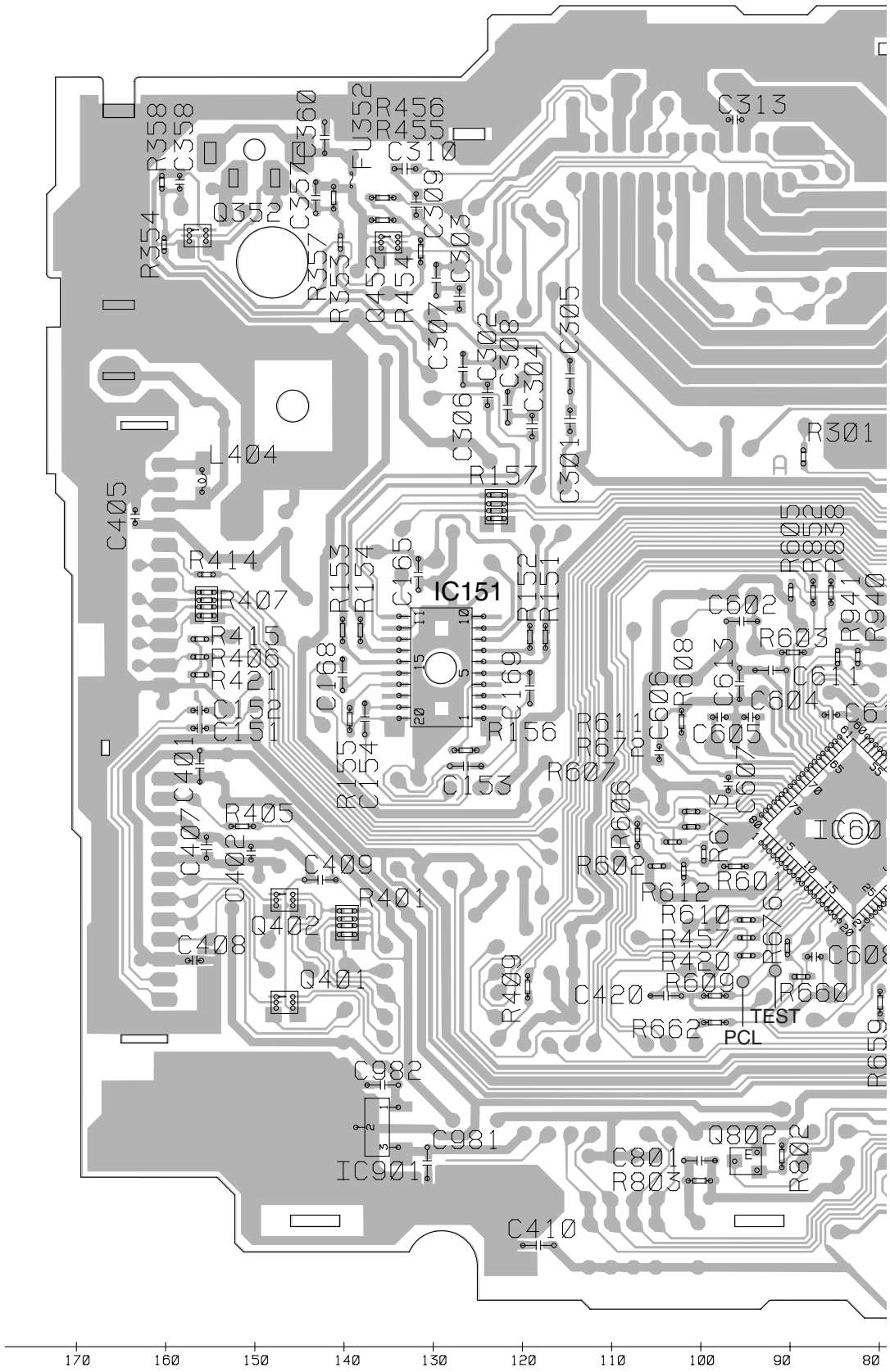




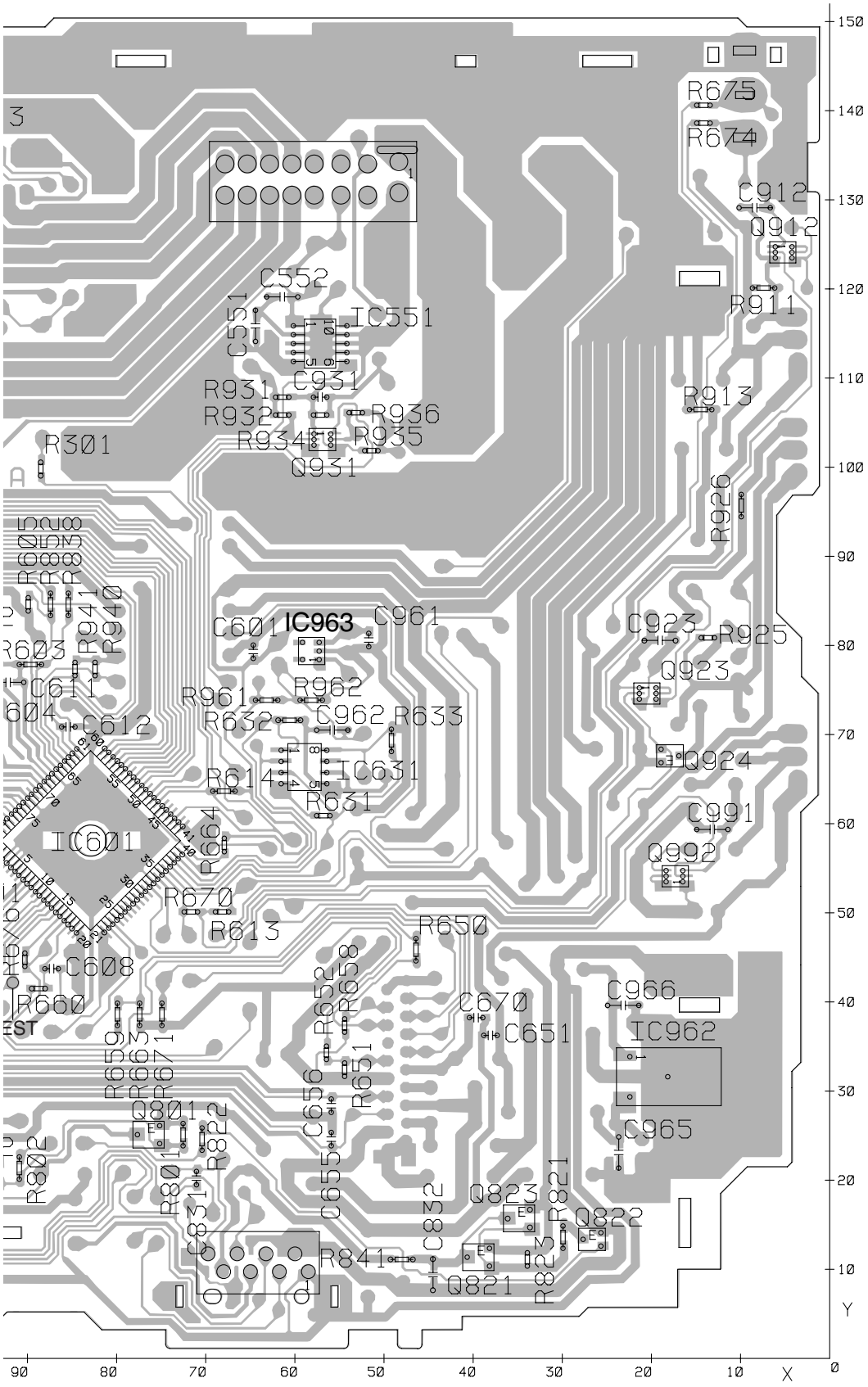
SIDE A


REAR OUTPUT
ANTENNA JACK
CN352
CN401
CN402
IC302
Z401
FM/AM TUNER UNIT
FRONT
70 80 90 100 110 120 130 140 150 160 170

A TUNER AMP UNIT

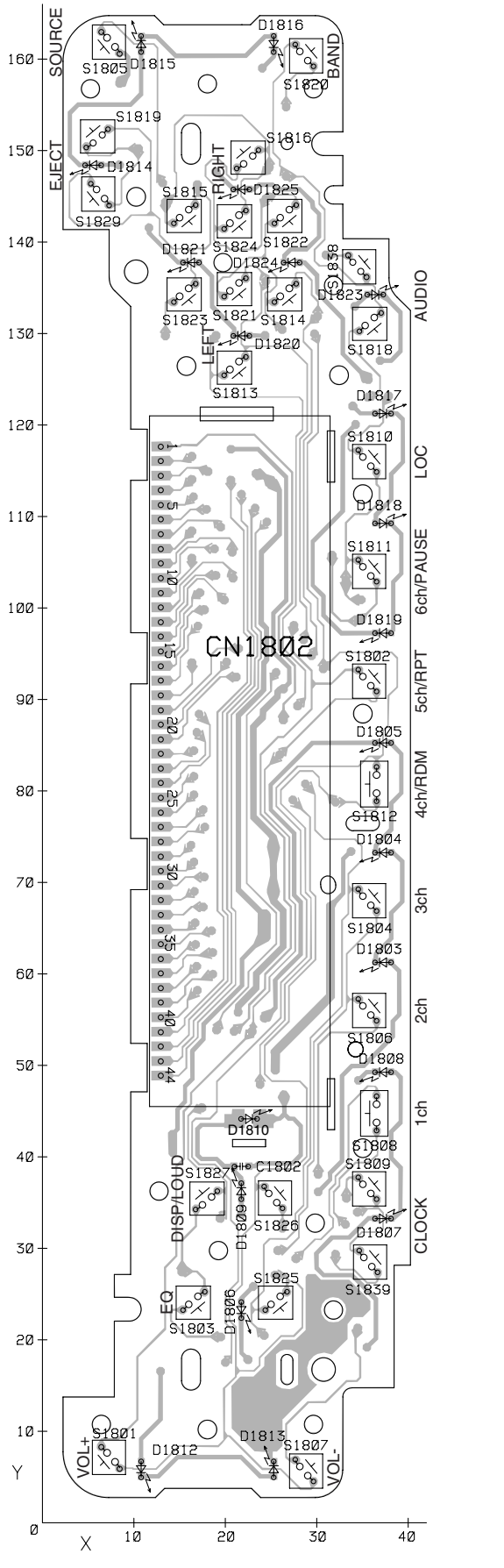


SIDE B

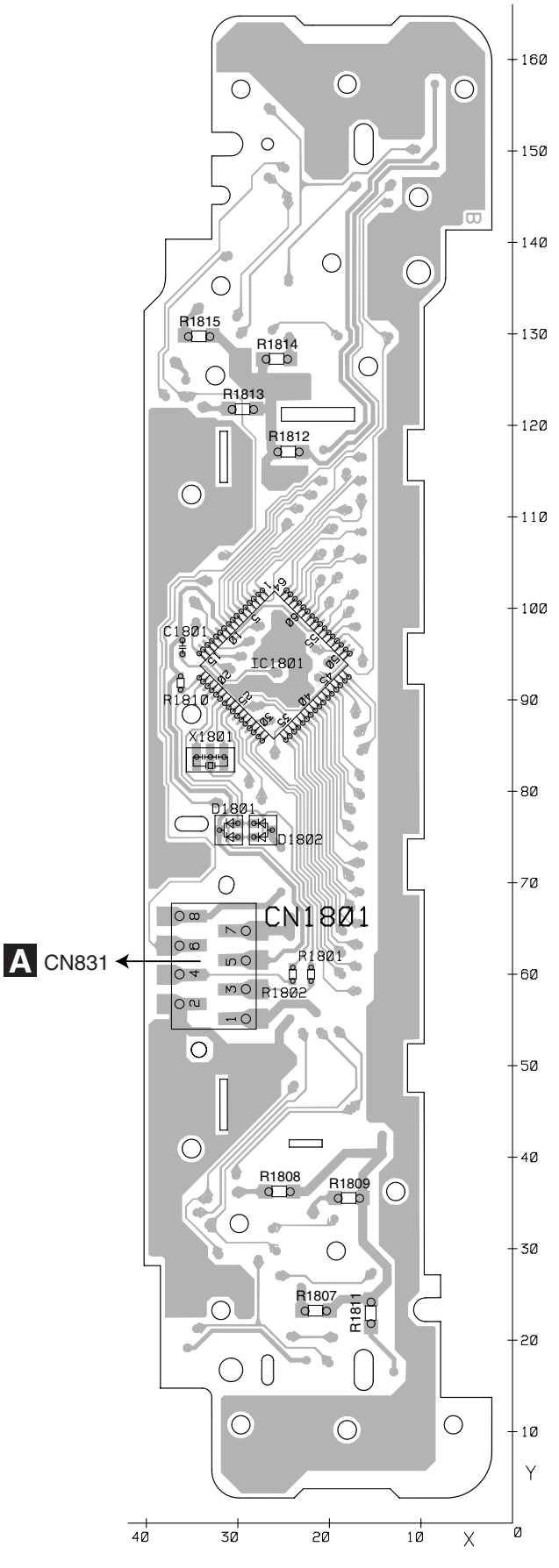

R675
R674
C912
Q912
R911
R913
R926
C923
R925
Q923
Q924
C991
Q992
C966
IC962
C965
C552
C551
IC551
C931
R931
R932
R936
R934
R935
Q931
R301
C601
IC963
C961
R961
R962
R632
C962
R633
R614
IC631
R631
C611
C612
IC601
R664
R670
R613
R650
C608
R660
C670
C651
R656
R658
R651
C655
C656
R802
R801
Q801
R822
C831
C832
Q823
R821
Q822
R841
Q821
R823
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Y
90
80
70
60
50
40
30
20
10
X

4.2 KEYBOARD UNIT

B KEYBOARD UNIT **SIDE A**



B KEYBOARD UNIT **SIDE B**



A

B

C

D

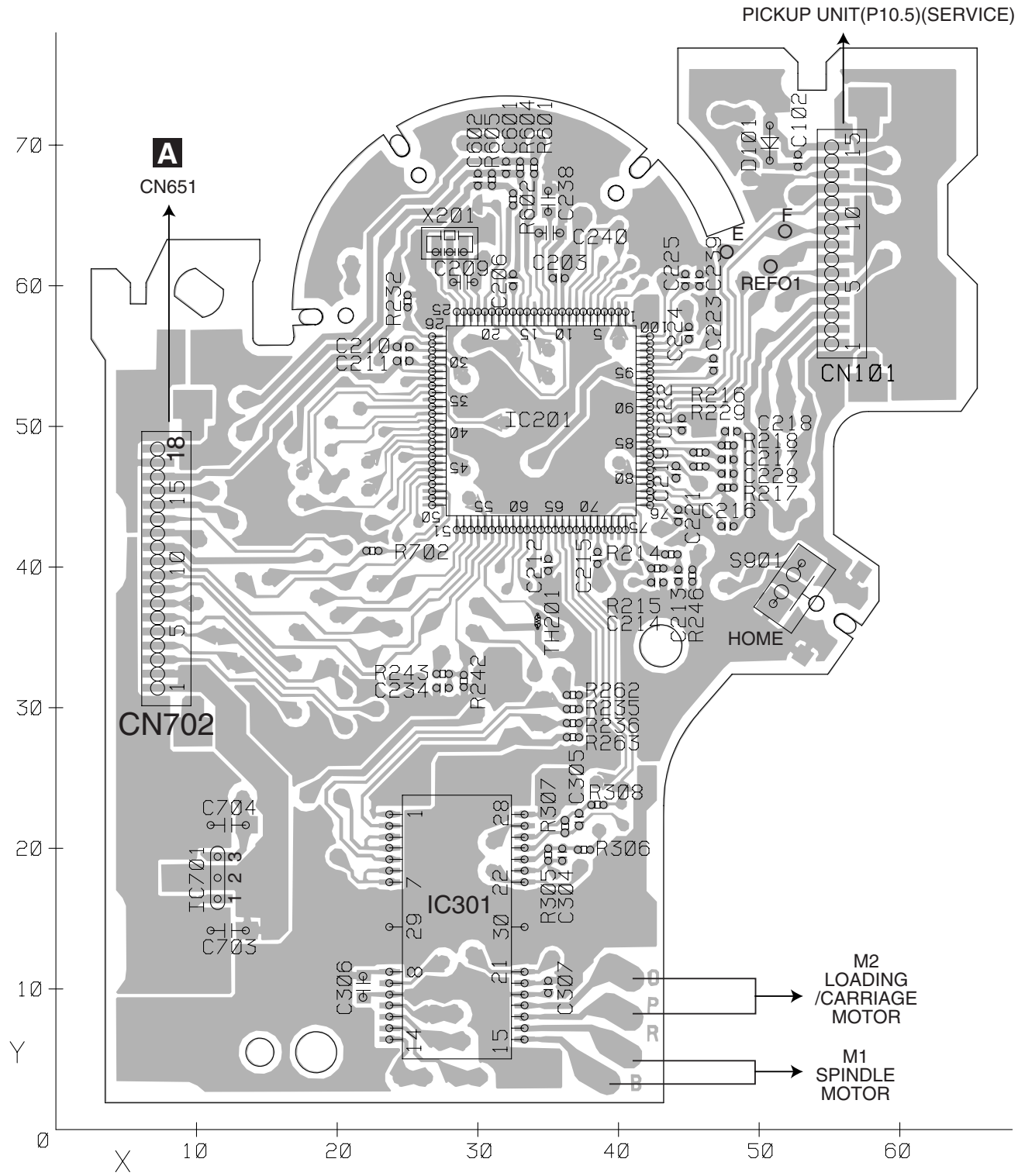
E

F

4.3 CD CORE UNIT(S10.5)

C CD CORE UNIT(S10.5)

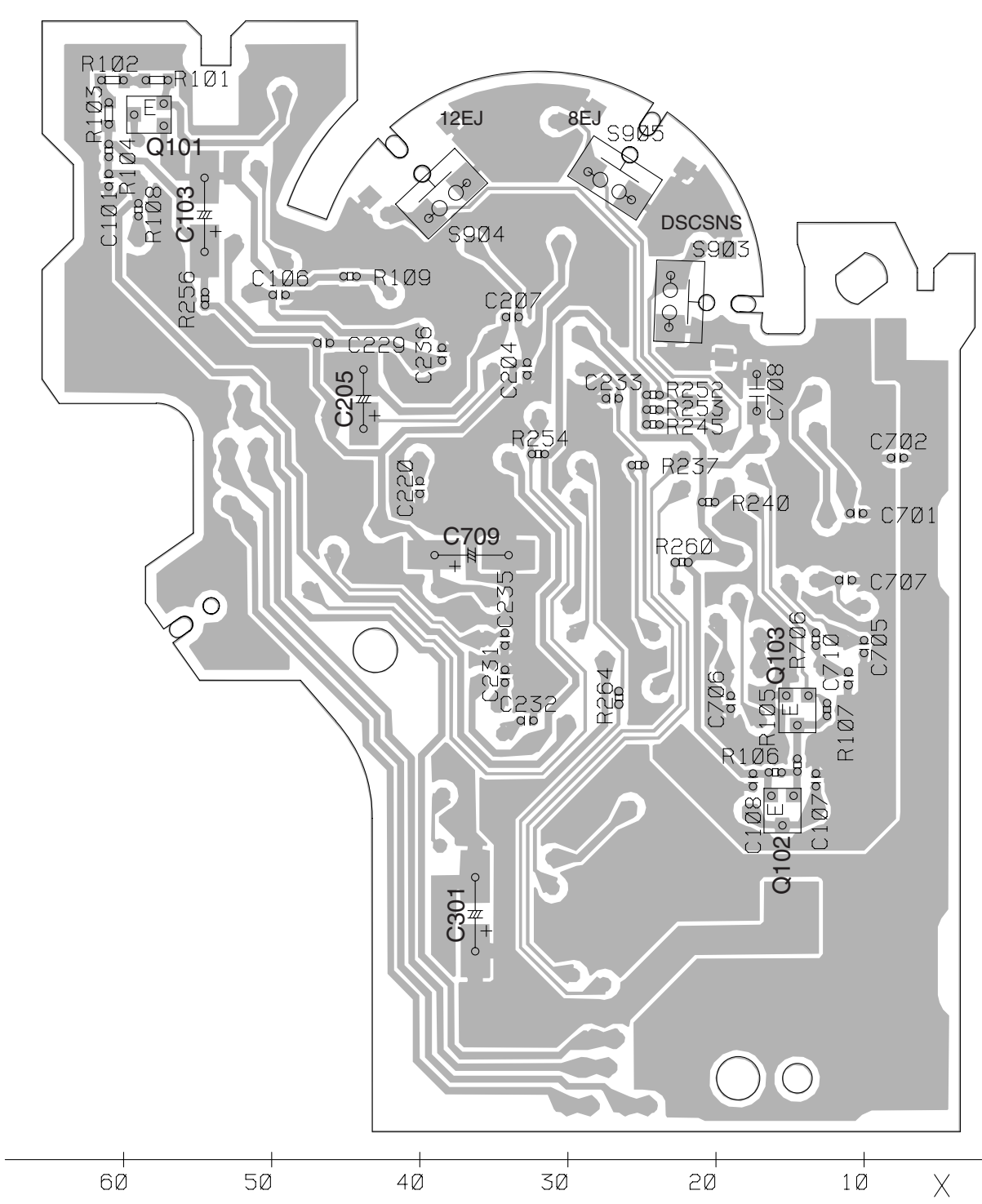
SIDE A



C

C CD CORE UNIT(S10.5)

SIDE B



5. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

  Chip Resistor

  RS1/◯S◯◯◯J,RS1/◯◯S◯◯◯J

  Chip Capacitor (except for CQS.....)

  CKS....., CCS....., CSZS.....
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Meaning of the figures and others in the parentheses in the parts list.*

  Example) IC 301 is on the point (face A, 91 of x-axis, and 111 of y-axis) of the corresponding PC board.

  IC 301 (A, 91, 111) IC NJM2068V

Circuit Symbol and No. **Part No.**

Unit Number : CWN1271

Unit Name : Tuner Amp Unit

Unit Number :

Unit Name : Keyboard Unit

Unit Number : CWX3090

Unit Name : CD Core Unit(S10.5)

A

Unit Number : CWN1271

Unit Name : Tuner Amp Unit

MISCELLANEOUS

IC 151	(B,133,80) IC	PML014A
IC 302	(A,94,135) IC	PAL007B
IC 601	(B,87,62) IC	PE5518A
IC 901	(B,143,29) IC	NJM2885DL1-33
IC 962	(B,22,36) Regulator IC	BD7802FP
IC 963	(B,62,83) IC	BD4834G
Q 352	(B,160,129) Transistor	UMH3N
Q 452	(B,139,128) Transistor	UMD2N
Q 801	(B,80,29) Transistor	2SA1036K
Q 821	(B,43,15) Transistor	2SA1036K
Q 822	(B,31,17) Transistor	DTC114EU
Q 911	(A,8,116) Transistor	2SD2396
Q 912	(B,9,128) Transistor	UMD2N
Q 921	(A,8,103) Transistor	2SD2396
Q 923	(B,24,79) Transistor	UMD2N
Q 931	(B,61,107) Transistor	UMX1N
Q 991	(A,8,69) Transistor	2SD2396
Q 992	(B,21,58) Transistor	UMD2N
D 551	(A,62,124) Diode	MPG06G-6415G3
D 552	(A,59,124) Diode	MPG06G-6415G3
D 901	(A,35,131) Diode	MPG06G-6415G3
D 902	(A,35,128) Diode	MPG06G-6415G3
D 911	(A,21,106) Diode	MPG06G-6415G3
D 912	(A,18,120) Diode	HZS6L(B2)
D 921	(A,24,87) Diode	HZS9L(B3)
D 931	(A,69,115) Diode	HZS7L(C3)
D 932	(A,54,108) Diode	HZS7L(A1)
D 961	(A,56,74) Diode	1SS133
D 991	(A,20,66) Diode	HZS7L(C3)
L 151	(A,146,93) Inductor	LAU2R2K
L 401	(A,157,58) Inductor	LAU2R2K
L 402	(A,148,88) Inductor	LAU2R2K
L 404	(B,160,101) Inductor	LCTAW220J2520
L 601	(A,93,85) Ferri-Inductor	LAU100K
L 602	(A,103,67) Inductor	LAU2R2K
L 651	(A,41,38) Inductor	LAU2R2K
L 801	(A,88,25) Inductor	LAU2R2K
L 901	(A,36,108) Choke Coil 600μH	CTH1280
X 601	(A,103,71) Radiator 12.58291MHz	CSS1402
⚠FU352	(B,143,135) Fuse 3A	CEK1286
⚠	Fuse 10A	CEK1208
AR401	(A,161,110) Arrester	DSP-201M-S00B
	FM/AM Tuner Unit	CWE1952

RESISTORS

R 301	(B,93,104)	RS1/16S153J
R 353	(B,144,128)	RS1/16S821J
R 354	(B,164,128)	RS1/16S821J
R 357	(B,145,133)	RS1/16S223J
R 358	(B,164,135)	RS1/16S223J
R 405	(B,155,62)	RS1/16S681J
R 407	(B,159,87)	RAB4C681J
R 414	(B,159,91)	RS1/16S681J
R 420	(B,99,48)	RS1/16S681J
R 421	(B,160,79)	RS1/16S473J
R 454	(B,135,127)	RS1/16S103J
R 455	(B,140,130)	RS1/16S153J
R 456	(B,140,133)	RS1/16S221J
R 457	(B,99,50)	RS1/16S681J
R 602	(B,109,58)	RS1/16S473J
R 606	(B,111,61)	RS1/16S104J
R 607	(B,107,61)	RS1/16S222J
R 608	(B,106,74)	RS1/16S0R0J
R 609	(B,102,43)	RS1/16S473J
R 610	(B,99,52)	RS1/16S681J

Circuit Symbol and No.		Part No.
R 612	(B,106,57)	RS1/16S103J
R 613	(B,72,54)	RS1/16S104J
R 633	(B,53,73)	RS1/16S104J
R 650	(B,50,50)	RS1/16S102J
R 651	(B,58,36)	RS1/16S104J
R 652	(B,60,38)	RS1/16S102J
R 655	(A,76,51)	RD1/4PU102J
R 659	(B,84,43)	RS1/16S221J
R 660	(B,93,46)	RS1/16S681J
R 662	(B,102,40)	RS1/16S682J
R 663	(B,81,43)	RS1/16S682J
R 670	(B,76,54)	RS1/16S104J
R 671	(B,79,43)	RS1/16S104J
R 801	(B,77,29)	RS1/16S153J
R 802	(B,95,25)	RS1/16S153J
R 803	(B,104,23)	RS1/16S222J
R 821	(B,34,18)	RS1/16S562J
R 822	(B,74,29)	RS1/16S102J
R 823	(B,38,15)	RS1/16S103J
R 833	(A,80,17)	RD1/4PU222J
R 834	(A,82,17)	RD1/4PU222J
R 835	(A,68,20)	RD1/4PU102J
R 836	(A,72,26)	RD1/4PU104J
R 837	(A,78,25)	RD1/4PU103J
R 838	(B,89,89)	RS1/16S102J
R 841	(B,52,15)	RS1/16S1R0J
R 848	(A,105,46)	RD1/4PU102J
R 851	(A,103,46)	RD1/4PU102J
R 852	(B,91,89)	RS1/16S102J
R 911	(B,11,124)	RS1/16S183J
R 912	(A,8,131)	RD1/4PU152J
R 913	(B,18,110)	RS1/16S0R0J
R 923	(A,19,90)	RD1/4PU821J
R 931	(B,65,112)	RS1/16S473J
R 932	(B,65,110)	RS1/16S104J
R 933	(A,55,116)	RD1/4PU102J
R 934	(B,61,110)	RS1/16S472J
R 935	(B,55,106)	RS1/16S473J
R 936	(B,57,110)	RS1/16S223J
R 940	(B,86,81)	RS1/16S104J
R 941	(B,89,81)	RS1/16S104J
R 961	(B,67,78)	RS1/16S102J
R 962	(B,62,78)	RS1/16S183J
R 991	(A,20,61)	RD1/4PU271J
R 992	(A,15,68)	RD1/4PU221J

CAPACITORS

C 151	(B,160,73)	CKSRYB224K10
C 152	(B,160,75)	CKSRYB224K10
C 153	(B,130,69)	CKSRYB105K6R3
C 154	(B,142,74)	CKSRYB105K6R3
C 165	(B,136,91)	CKSRYB104K16
C 166	(A,134,92)	CEJQ470M10
C 167	(A,128,92)	CEJQ100M16
C 301	(B,119,108)	CKSQYB474K16
C 302	(B,128,111)	CKSQYB474K16
C 303	(B,131,122)	CKSQYB474K16
C 304	(B,123,107)	CKSQYB474K16
C 305	(B,119,113)	CKSRYB474K10
C 306	(B,131,114)	CKSRYB474K10
C 307	(B,134,124)	CKSRYB474K10
C 308	(B,126,109)	CKSRYB474K10
C 309	(B,136,132)	CKSQYB225K10
C 310	(B,137,136)	CKSQYB225K10
C 312	(A,104,125)	CEJQ100M16
C 313	(B,100,142)	CKSRYB104K16
C 353	(A,134,120)	CEJQ2R2M50
C 354	(A,134,110)	CEJQ2R2M50
C 401	(B,160,69)	CKSRYB103K50
C 402	(B,154,59)	CKSRYB103K50
C 403	(A,151,58)	CEJQ470M6R3
C 404	(A,151,95)	CEJQ101M10
C 405	(B,167,97)	CKSRYB103K50
C 409	(B,147,56)	CCSRCH470J50
C 410	(B,122,15)	CKSRYB102K50
C 420	(B,108,43)	CCSRCH470J50
C 451	(A,132,132)	CEJQ330M10
C 601	(B,69,83)	CKSRYB103K50
C 604	(B,98,75)	CCSRCH200J50
C 605	(B,102,75)	CCSRCH200J50
C 606	(B,109,71)	CKSRYB104K16
C 608	(B,91,48)	CCSRCH101J50
C 610	(A,101,82)	CEJQ4R7M35
C 611	(B,96,80)	CKSRYB224K10
C 651	(B,42,40)	CKSRYB105K10
C 670	(B,44,42)	CCSRCH221J50
C 801	(B,104,25)	CKSRYB105K6R3
C 832	(B,49,13)	CKSRYB104K16
C 901	(A,36,140)	CEAT332M16(P45)
C 911	(A,16,96)	CEJQ470M10
C 912	(B,12,133)	CKSRYB103K50
C 913	(A,19,137)	CEAT102M16
C 921	(A,25,66) 330μF/16V	CCH1326
C 922	(A,24,82)	CEJQ101M16
C 923	(B,23,85)	CKSRYB103K50
C 961	(B,56,85)	CKSRYB473K50
C 962	(B,60,75)	CKSRYB105K6R3
C 964	(A,25,29)	CEJQ220M10
C 965	(B,28,27)	CKSRYB105K10
C 981	(B,135,25)	CKSRYB334K10
C 983	(A,144,38)	CEJQ470M10
C 991	(B,17,63)	CKSRYB473K50
C 992	(A,17,54)	CEJQ101M10

B

Unit Number :

Unit Name : Keyboard Unit

MISCELLANEOUS

IC 1801	(B,32,100) IC	PD6340A
D 1803	(A,43,67) LED	SML-310PT
D 1804	(A,43,79) LED	SML-310PT
D 1805	(A,43,91) LED	SML-310PT
D 1806	(A,28,29) LED	SML-310PT
D 1807	(A,43,39) LED	SML-310PT
D 1808	(A,43,55) LED	SML-310PT
D 1809	(A,28,42) LED	SML-310PT
D 1810	(A,29,50) LED	NESW505C-5273

Circuit Symbol and No.			Part No.
D 1812	(A,17,12)	LED	SML-310PT
D 1813	(A,31,12)	LED	SML-310PT
D 1814	(A,12,154)	LED	SML-310PT
D 1815	(A,17,168)	LED	SML-310PT
D 1816	(A,31,168)	LED	SML-310PT
D 1817	(A,43,127)	LED	SML-310PT
D 1818	(A,43,115)	LED	SML-310PT
D 1819	(A,43,103)	LED	SML-310PT
D 1820	(A,28,136)	LED	SML-310PT
D 1821	(A,22,144)	LED	SML-310PT
D 1823	(A,42,140)	LED	SML-310PT
D 1824	(A,33,144)	LED	SML-310PT
D 1825	(A,28,152)	LED	SML-310PT
X 1801	(B,39,90)	Ceramic Resonator 5.00MHz	CSS1547
	LCD		CAW1905

RESISTORS

R 1801	(B,28,66)	RS1/16S222J
R 1802	(B,30,66)	RS1/16S222J
R 1807	(B,27,29)	RS1/4SA471J
R 1808	(B,31,42)	RS1/4SA471J
R 1809	(B,24,42)	RS1/4SA681J
R 1810	(B,42,98)	RS1/16S104J
R 1811	(B,21,29)	RS1/4SA681J
R 1812	(B,30,123)	RS1/4SA471J
R 1813	(B,35,128)	RS1/4SA471J
R 1814	(B,32,133)	RS1/4SA681J
R 1815	(B,40,136)	RS1/4SA471J

CAPACITORS

C 1801	(B,42,102)	CKSRYB103K50
C 1802	(A,28,45)	CKSRYF104Z25

C

Unit Number : CWX3090
Unit Name : CD Core Unit(S10.5)

MISCELLANEOUS

IC 201	(A,39,54)	IC	PE5497B
IC 301	(A,33,18)	IC	BA5839FP
Q 101	(B,62,75)	Transistor	2SA1577
Q 102	(B,20,28)	Chip Transistor	2SB1689
X 201	(A,32,66)	Ceramic Resonator 16.934MHz	CSS1603
S 901	(A,58,41)	Switch(HOME)	CSN1067
S 903	(B,25,62)	Switch(DSCSNS)	CSN1067
S 904	(B,44,71)	Switch(12EJ)	CSN1068
S 905	(B,30,72)	Switch(8EJ)	CSN1068

RESISTORS

R 101	(B,62,77)	RS1/10SR2R4J
R 102	(B,65,77)	RS1/10SR2R4J
R 103	(B,65,75)	RS1/10SR2R7J
R 105	(B,19,31)	RS1/16SS102J
R 106	(B,20,30)	RS1/16SS473J
R 108	(B,63,68)	RS1/16SS105J
R 109	(B,49,64)	RS1/16SS102J
R 214	(A,48,45)	RS1/16SS332J
R 215	(A,47,44)	RS1/16SS183J
R 216	(A,50,52)	RS1/16SS122J
R 217	(A,52,50)	RS1/16SS562J
R 218	(A,52,53)	RS1/16SS472J
R 232	(A,29,63)	RS1/16SS0R0J
R 235	(A,41,34)	RS1/16SS103J
R 236	(A,41,33)	RS1/16SS103J
R 237	(B,29,51)	RS1/16SS221J
R 240	(B,25,48)	RS1/16SS473J
R 242	(A,33,36)	RS1/16SS103J
R 243	(A,32,36)	RS1/16SS473J
R 245	(B,28,54)	RS1/16SS104J
R 246	(A,49,43)	RS1/16SS103J
R 252	(B,28,56)	RS1/16SS104J
R 253	(B,28,55)	RS1/16SS104J
R 254	(B,36,52)	RS1/16SS104J
R 260	(B,26,44)	RS1/16SS103J
R 262	(A,41,35)	RS1/16SS472J
R 263	(A,41,32)	RS1/16SS472J
R 264	(B,31,35)	RS1/16SS102J
R 305	(A,39,24)	RS1/16SS183J
R 306	(A,42,24)	RS1/16SS183J
R 307	(A,40,26)	RS1/16SS183J
R 308	(A,43,27)	RS1/16SS183J
R 601	(A,38,72)	RS1/16SS101J
R 602	(A,37,70)	RS1/16SS101J
R 702	(A,27,45)	RS1/16SS221J
R 706	(B,17,39)	RS1/16SS221J

CAPACITORS

C 103	(B,59,68)	CEVW101M16
C 203	(A,40,65)	CKSSYB104K10
C 205	(B,48,55)	CEVW220M6R3
C 206	(A,37,64)	CKSSYB103K16
C 209	(A,33,64)	CKSRYB104K16
C 210	(A,29,60)	CKSSYB104K10
C 211	(A,29,59)	CKSSYB104K10
C 212	(A,39,44)	CKSSYB104K10
C 213	(A,48,43)	CKSSYB103K16
C 214	(A,47,43)	CKSSYB104K10
C 215	(A,43,45)	CKSSYB104K10
C 216	(A,52,47)	CKSSYB182K50
C 217	(A,52,52)	CCSSCH560J50
C 218	(A,52,54)	CCSSCH5R0C50
C 219	(A,48,51)	CKSSYB104K10
C 220	(B,44,49)	CKSSYB104K10
C 221	(A,48,48)	CKSSYB104K10
C 222	(A,49,54)	CKSSYB104K10
C 223	(A,51,58)	CCSSCH680J50
C 224	(A,49,61)	CCSSCH470J50
C 225	(A,49,64)	CKSSYB103K16
C 229	(B,51,59)	CKSSYB104K10
C 231	(B,38,37)	CKSSYB102K50
C 232	(B,37,34)	CKSSYB102K50
C 233	(B,31,55)	CKSSYB103K16
C 236	(B,43,58)	CKSSYB104K10
C 238	(A,39,70)	CKSRYB104K16
C 240	(A,39,68)	CKSRYB104K16
C 304	(A,40,24)	CKSSYB472K25
C 305	(A,41,26)	CKSSYB103K16

Circuit Symbol and No.		Part No.
C 306	(A,26,14)	CKSRYB105K10
C 705	(B,14,39)	CCSSCH101J50
C 710	(B,15,37)	CKSSYB102K50

Miscellaneous Parts List

	Pickup Unit(P10.5)(Service)	CXX1942
M 1	Motor Unit(SPINDLE)	CXC6742
M 2	Motor Unit(LOADING/CARRIAGE)	CXC4026

6. ADJUSTMENT
6.1 CD ADJUSTMENT

1) Cautions on adjustments

• In this product the single voltage (3.3V) is used for the regulator. The reference voltage is the REFO1 (1.65V) instead of the GND.
If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:
a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments. Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.
b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.
c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

• For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

• The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

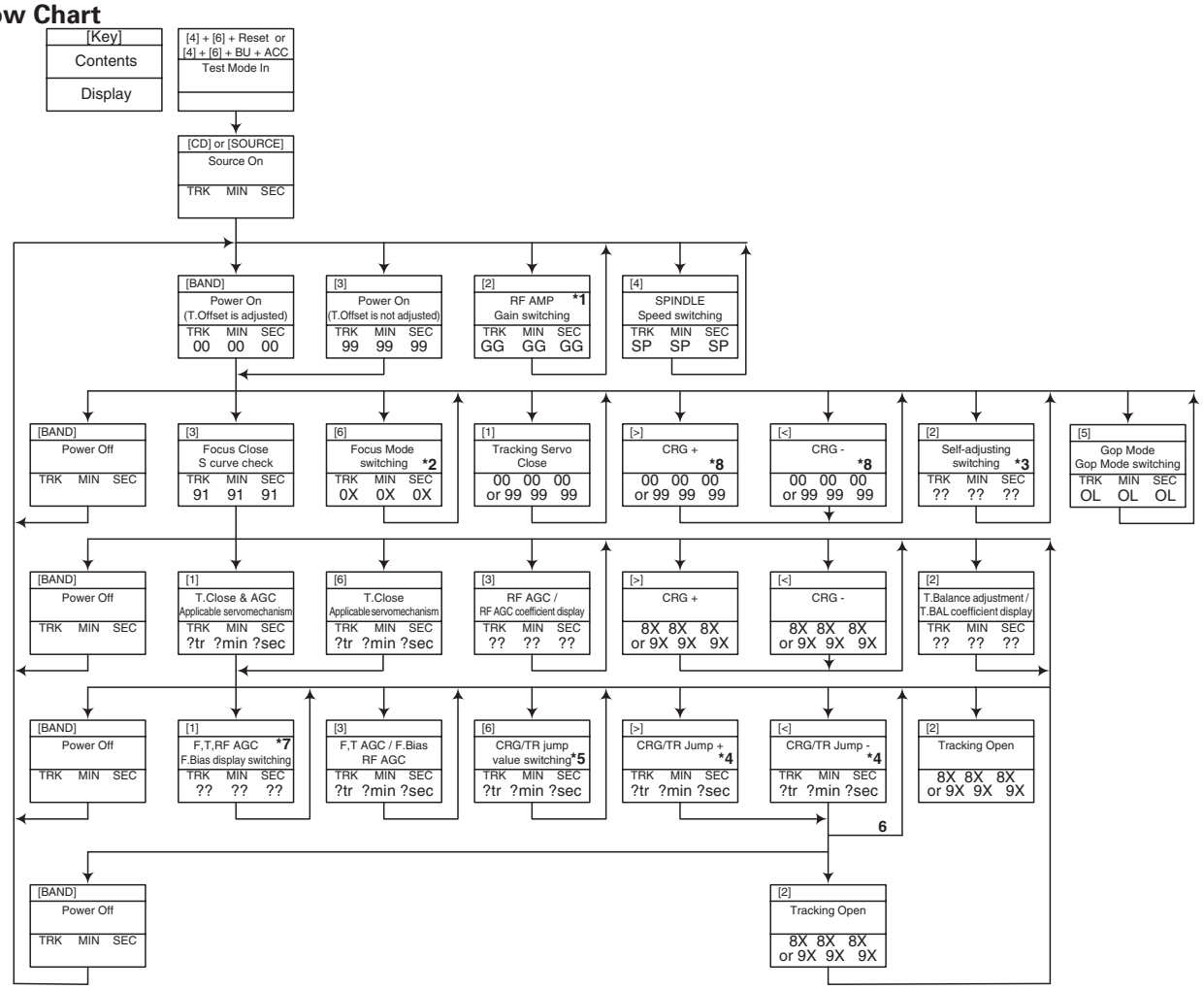
• The load and eject operation is not guarantied with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.
• To enter the test mode.
While pressing the 4 and 6 keys at the same time, reset.
• To exit from the test mode.
Turn off the ACC and back up.

Notes:
a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.
b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.
c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.
d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.
e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0dB, and the auto-adjustment values are reset to the default settings.

● Flow Chart



*1) TYP (TRK MIN SEC) → + 6 dB ($^{TRK}06^{MIN}06^{SEC}06$) → + 12 dB ($^{TRK}12^{MIN}12^{SEC}12$)

*2) Focus Close → S Curve check setting → F EQ measurement setting
$^{TRK}00^{MIN}00^{SEC}00$ $^{TRK}01^{MIN}01^{SEC}01$ $^{TRK}02^{MIN}02^{SEC}02$
($^{TRK}99^{MIN}99^{SEC}99$)

*3) F.Offset Display → RF.Offset → T.Offset Display → Switch to the order of the original display

*4) 1TR/4TR/10TR/32TR/100TR

*5) Single → 4TR →10TR → 32TR → 100TR → CRG Move
9x(8x):91(81) 92(82) 93(83) 94(84) 95(85) 96(86)

*6) Only at the time of CRG move, 100TR jump

*7) TRK/MIN/SEC → F.AGC → T.AGC → F.Bias → RF AGC

*8) CRG motor voltage = 2 [V]

[Key]	Operation Test Mode
[BAND]	Power On/Off
[>]	CRG + / TR Jump + (Direction Of the external surface)
[<]	CRG - / TR Jump - (Direction Of the internal surface)
[1]	T. CLS & AGC & Applicable servomechanism / AGC,AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T. Open
[3]	F. Close,S Curve / Rough Servo and RF AGC / F,T,RF AGC
[4]	
[5]	Error Rate measurement ON : ERR 30Counts Start BER display data[%]
[6]	F. Mode switching / Tracking Close / CRG•TR Jump Switching

*) • After the [Eject] key is pressed keys other than the [Eject] key should not be pressed, until disc ejection is complete.
• When the key [2] or [3] is pressed during the Focus Search, the power supply should be immediately turned off (otherwise the lens sticks to Wall, causing the actuator to be damaged).
• In the case of TR jump other than to 100TR, the function shall continue to be processed even if the TR jump key is released. As for the CRG Move and 100TR Jump, the mechanism shall be set to the Tracking Close mode when the key is released.
• When the power is turned on/off the jump mode is reset to the Single TR (91) while the gain of the RFAMP is reset to 0 dB. At the same time all the self-adjusting values shall return to the default setting.

6.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

• **Note :**
The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

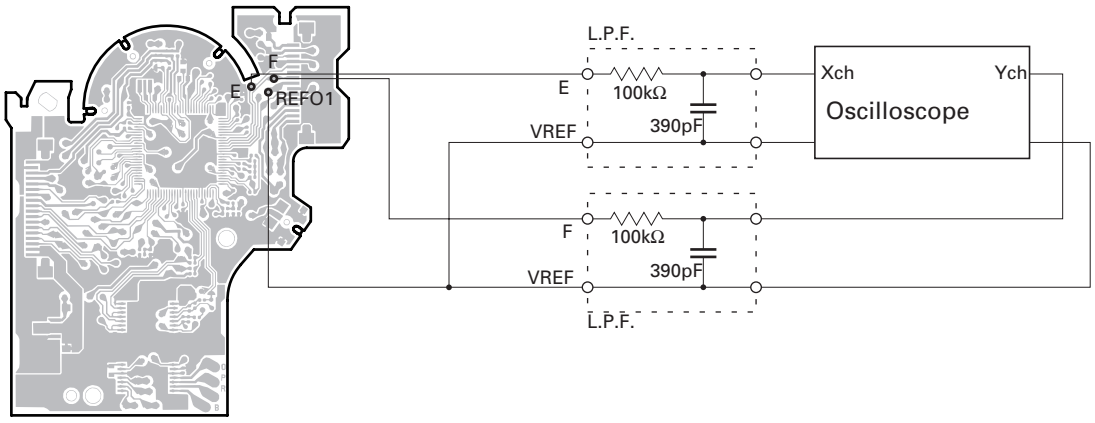
• **Purpose :**
To check that the grating is within an acceptable range when the PU unit is changed.

• **Symptoms of Mal-adjustment :**
If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

• **Method :**

• Measuring Equipment	• Oscilloscope, Two L.P.F.
• Measuring Points	• E, F, REFO1
• Disc	• TCD-782
• Mode	• TEST MODE

CD CORE UNIT(S10.5)



• **Checking Procedure**
1. In test mode, load the disc and switch the 3V regulator on.
2. Using the → and ← buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

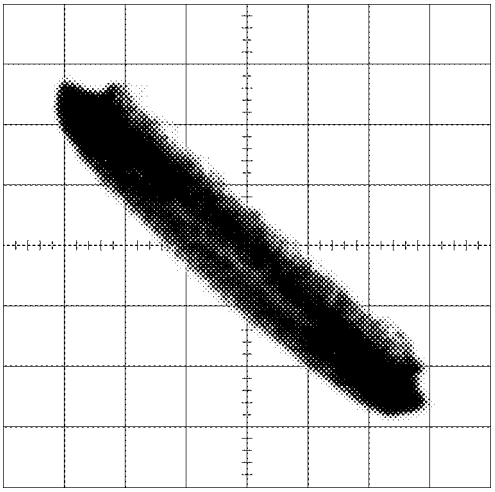
• **Note**
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• **Hint**
Reloading the disc changes the clamp position and may decrease the "wobble".

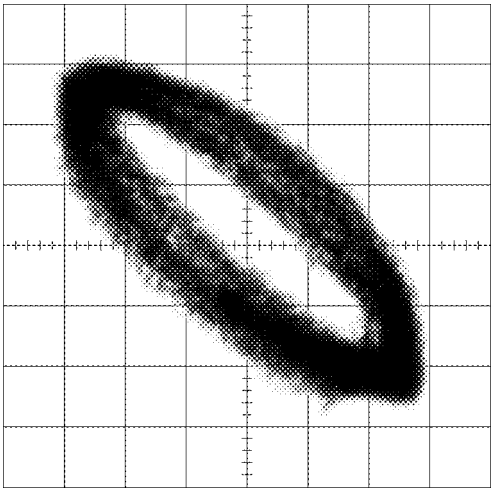
Grating waveform

Ech → Xch 20mV/div, AC
Fch → Ych 20mV/div, AC

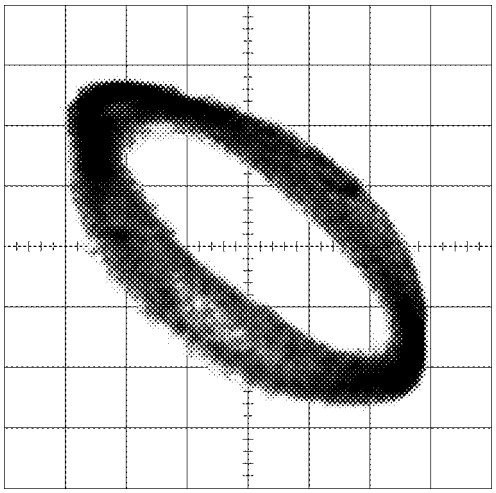
0°



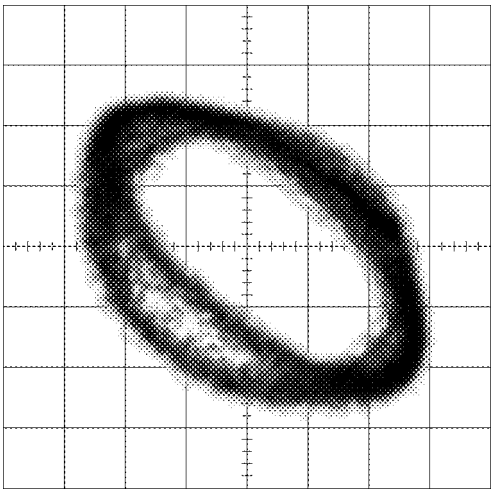
30°



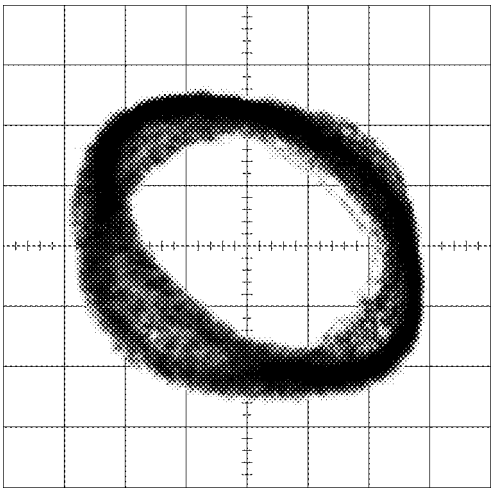
45°



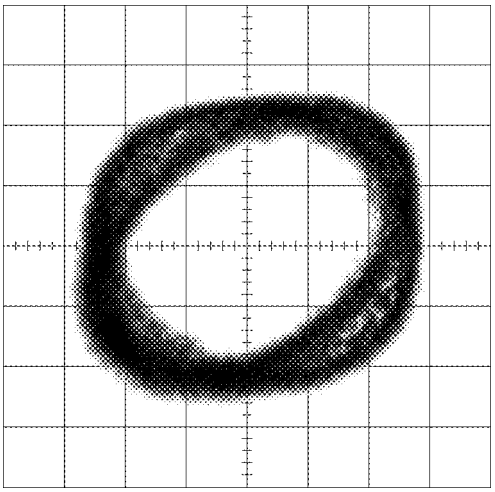
60°



75°



90°



6.3 ERROR MODE

● Error Messages

If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

8-digit display	6-digit display	4-digit display
ERROR–xx	ERR–xx	E–xx

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG SERVO LSI Communication Error	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. → Failure on home switch or CRG move mechanism. Communication error between microcomputer and SERVO LSI.
11	Electricity	Focus Servo NG	Focusing not available. → Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. CD signal error.
17	Electricity	Setup NG	AGC protection doesn't work. Focus can be easily lost. → Damages or stains on disc, or excessive vibrations on REWRITABLE.
30	Electricity	Search Time Out	Failed to reach target address. → CRG tracking error or damages on disc.
44	Electricity	ALL Skip	Skip setting for all track. (CD-R/RW)
50	Mechanism	CD On Mech Error	Mechanical error during CD ON. → Defective loading motor, mechanical lock and mechanical sensor.
A0	System	Power Supply NG	Power (VD) is ground faulted. → Failure on SW transistor or power supply (failure on connector).

Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

Unreadable TOC does not constitute an error. An intended operation continues in this case.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

6.4 SYSTEM MICROCOMPUTER TEST PROGRAM

● PCL Output

In the normal operation mode (with the detachable panel installed, the ACC switched ON, the standby mode cancelled), shift the TESTIN IC601(Pin 15) terminal to H. The clock signal is output from the PCL terminal IC601(Pin 14).
The frequency of the clock signal is 786.432 kHz that is one 16th of the fundamental frequency. The clock signal should be 786.432 kHz ± 31.5 Hz. If the clock signal is out of the range, the X'tal (X601) should be replaced with new one.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

● **Removing the Case (not shown)**

1. Remove the Case.

● **Removing the CD Mechanism Module (Fig.1)**

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

● **Removing the Grille Assy (Fig.1)**

2 Release the two latchs and then remove the Grille Assy.

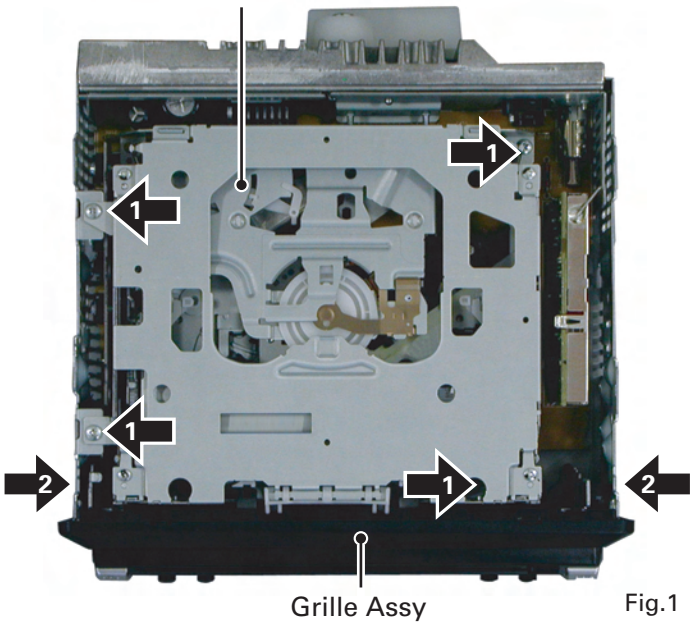


Fig.1

● **Removing the Tuner Amp Unit (Fig.2)**

1 Remove the screw.

2 Remove the three screws.

3 Straighten the tabs at three locations indicated and then remove the Tuner Amp Unit.

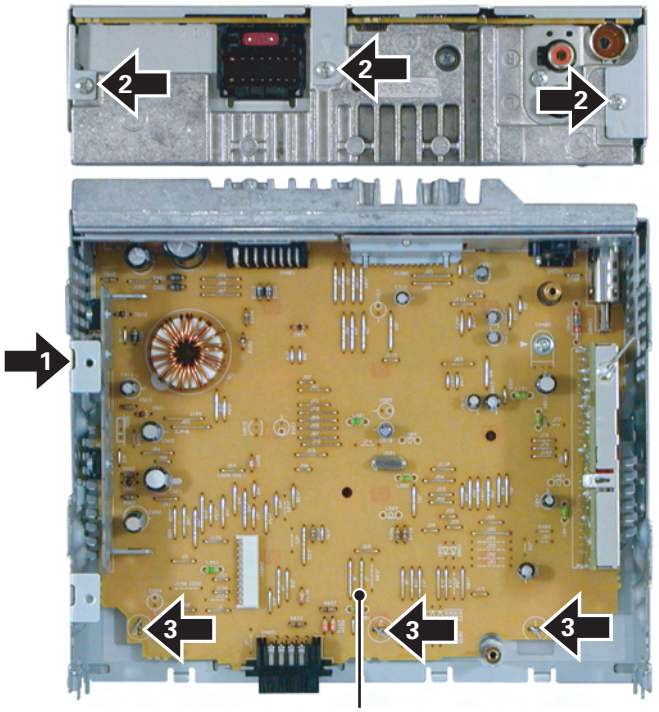
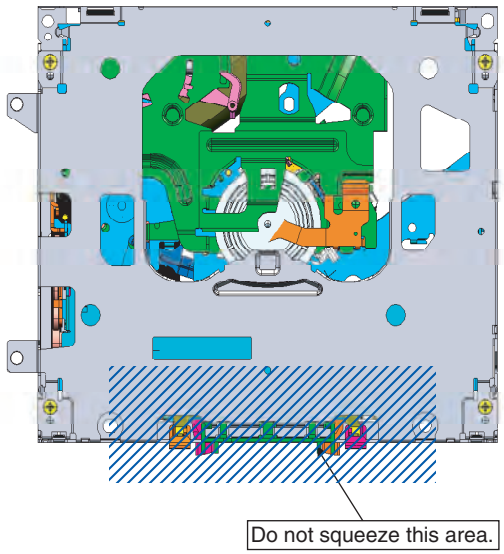


Fig.2

● How to hold the Mechanism Unit

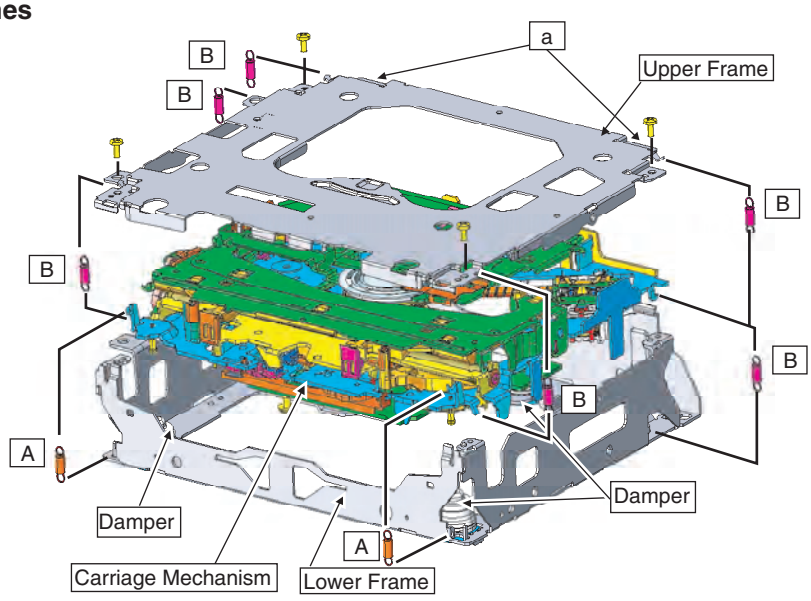
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

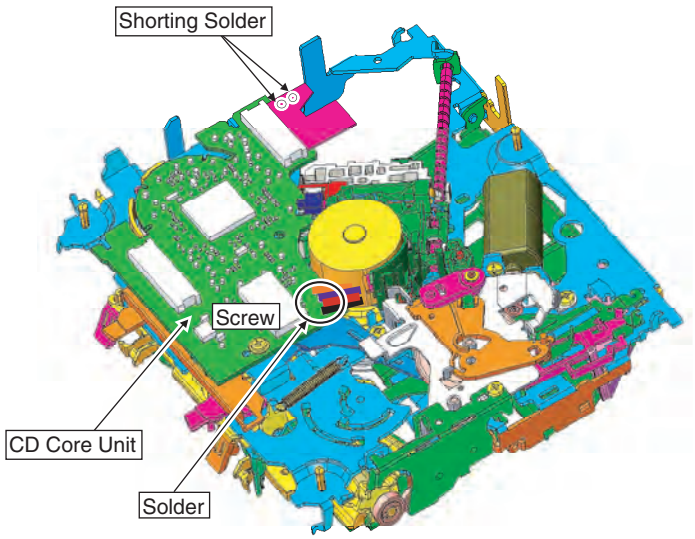
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.



● How to remove the CD Core Unit

1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

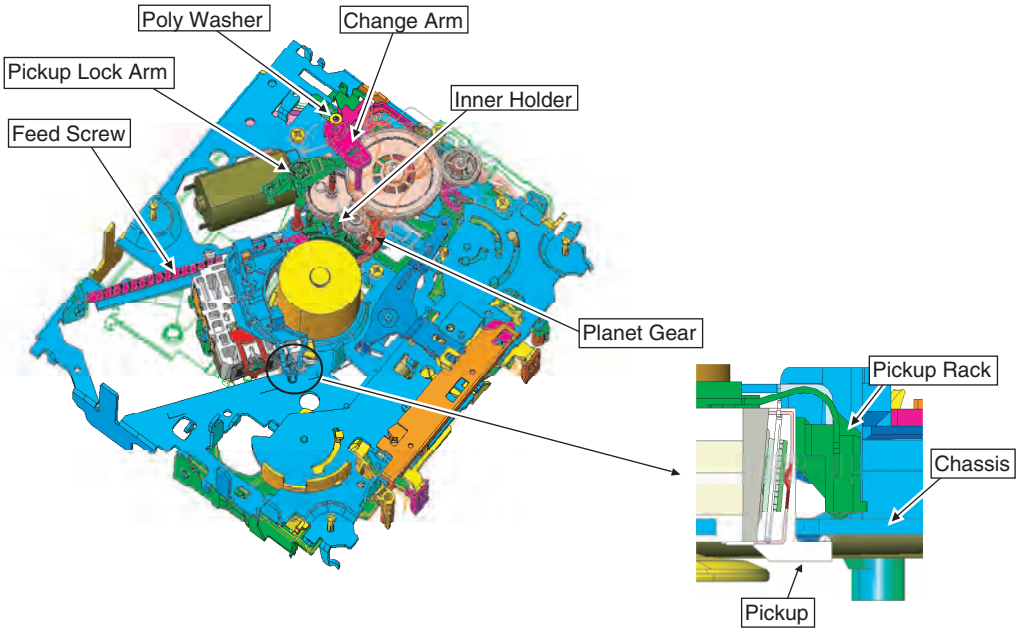
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



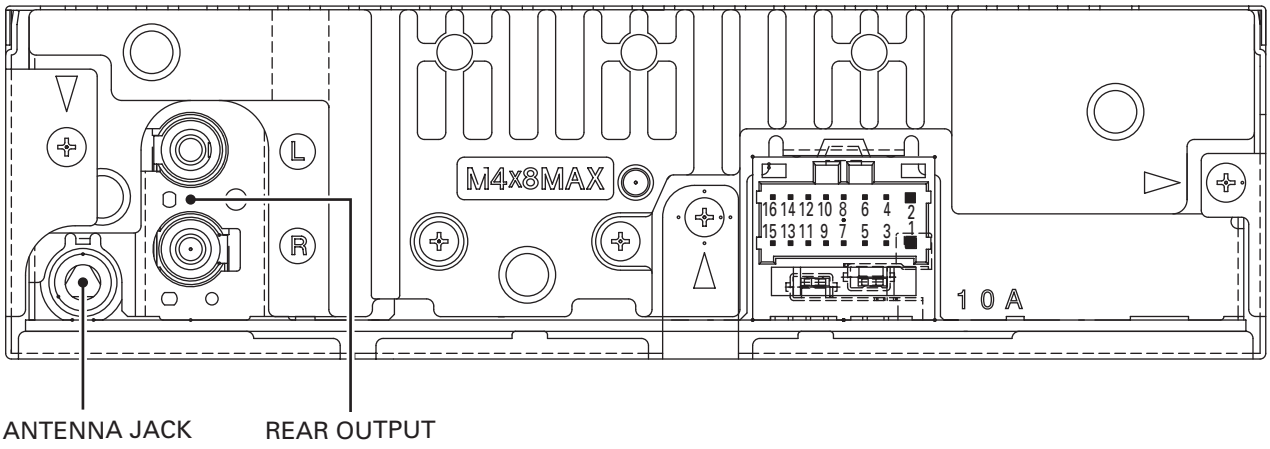
● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



7.1.2 CONNECTOR FUNCTION DESCRIPTION



Pin No.		Pin No.	
1	B.UP	9	RL-
2	GND	10	FL-
3	ACC	11	RL+
4	NC	12	FL+
5	NC	13	RR-
6	B.REMOTE	14	FR-
7	NC	15	RR+
8	NC	16	FR+

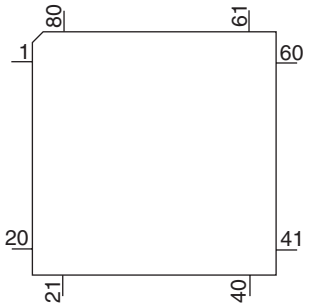
7.2 PARTS
7.2.1 IC

● **Pin Functions (PE5518A)**

Pin No.	Pin Name	I/O	Function and Operation
1	MODEL1	I	Model select input
2,3	NC		Not used
4	AVSS		GND
5,6	NC		Not used
7	AREF1		VDD
8	KYDT	I	Display microcomputer data input
9	DPDT	O	Display microcomputer communication data output
10	NC		Not used
11	TUNPDI	I	PLL data input
12	TUNPDO	O	PLL data output
13	TUNPCK	O	PLL clock output
14	PCL	O	Clock adjustment output
15	TESTIN	I	Test program input
16	BSI	I	Bus serial data input
17	BDATA	O	Bus serial output data
18	BSCK	O	Bus serial clock output
19	DORAON		Not used
20	NC		Not used
21	$\overline{\text{SWVDD}}$	O	Display microcomputer chip select output
22	ILMPW	O	Illumination power output
23-31	NC		Not used
32	DALMON	O	Output for dark current reduction circuit / Stand-by mode : L output
33	VSS		GND
34	BRST	O	Bus reset output
35	BRXEN	I/O	Bus RX enable input/output
36	CDRESET	O	CD microcomputer reset signal output
37	ROMDATA	O	ROM collection data output
38	ROMCLK	O	ROM collection clock output
39	ROMCS	O	ROM collection chip select output
40	RECEIVE	O	RDS decoder receiving output
41,42	NC		Not used
43	SYSPW	O	System power output
44-46	NC		Not used
47	STRKEY2	I	Wired remote control input 2
48	MUTE	O	System mute output
49	ANTPW	O	Auto antenna control output
50	NC		Not used
51	VST	O	E.VOL strobe output
52	VDT	O	E.VOL data output
53	VCK	O	E.VOL clock output
54	NC		Not used
55	TUNPCE2	O	PLL chip enable output 2
56	TUNPCE	O	PLL chip enable output
57	RDT	I	RDS LK input
58	RDSLK	I	RDS clock input
59	RDS57K	I	RDS 57K input
60	RESET		Reset
61	LDET	I	PLL lock detection input
62	RCK	I	RDS clock input
63	$\overline{\text{ASENS}}$	I	ACC sense input
64	$\overline{\text{BSENS}}$	I	Back up sense input
65	$\overline{\text{DSENS}}$	I	Grille detach sense input
66	$\overline{\text{SOURCE}}$	I	Source sense input
67	VSS		GND
68	VDD		VDD

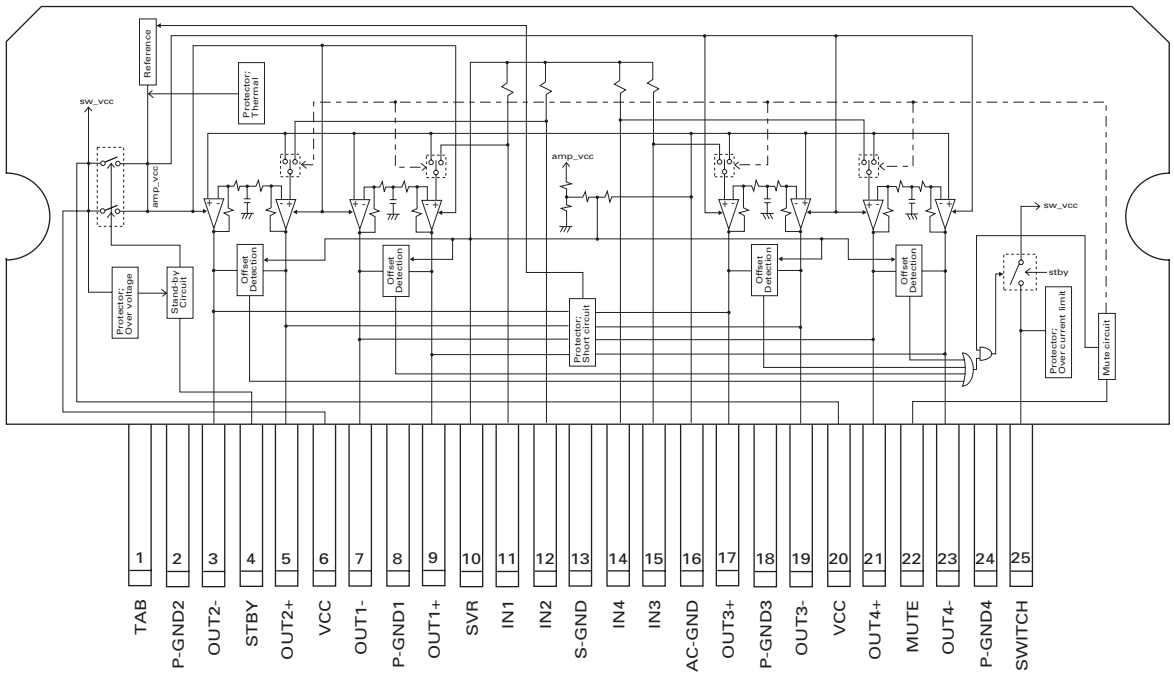
Pin No.	Pin Name	I/O	Function and Operation
69,70	X2,1		Crystal oscillator connection pin
71	IC(VPP)		GND
72	NC		Not used
73	VSS		VSS
74	AVDD		VDD
75	AVREF1		VDD
76	SL	I	Signal level input
77,78	NC		Not used
79	BSRQ	I	Bus slave service request
80	STRKEY1	I	Wired remote control input 1

*PE5518A



IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

PAL007B



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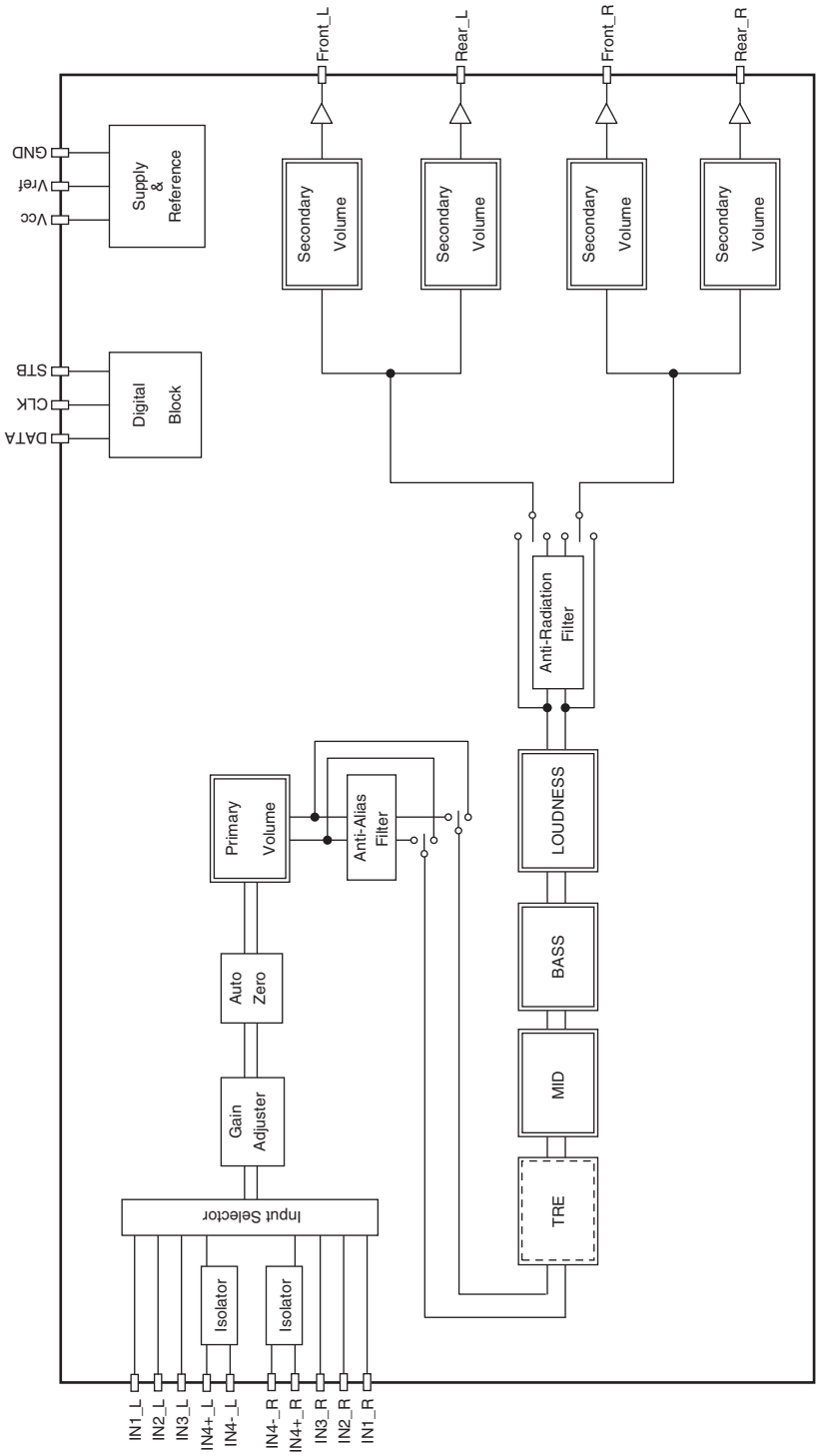
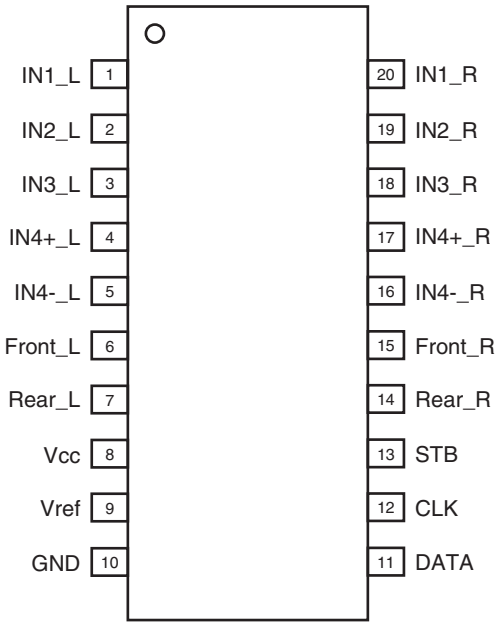
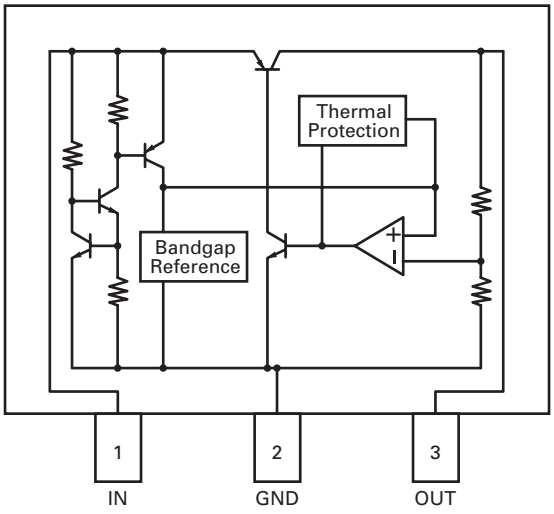
● Block Diagram



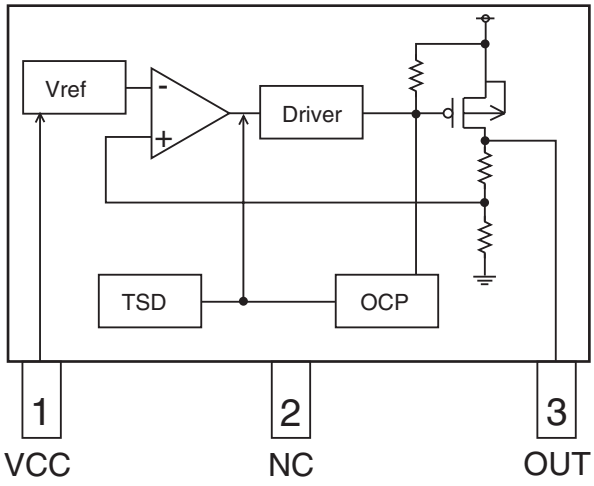
● Pin Layout



NJM2885DL1-33



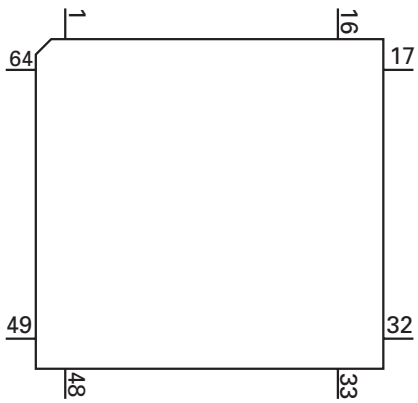
BD7802FP



● Pin Functions(PD6340A)

Pin No.	Pin Name	I/O	Function and Operation
1-5	SEG4-0	O	LCD segment output
6-9	COM3-0	O	LCD common output
10	VLCD		LCD drive power supply
11-14	KST3-0	O	Key strobe output
15,16	KDT0,1	I	Key data input (analogue input)
17	REW	I	Remote control reception input
18	DPDT	I	Display data input
19	NC		Not used
20	KYDT	O	Key data output
21	MODA		GND
22	X0		Crystal oscillator connection pin
23	X1		Crystal oscillator connection pin
24	VSS		GND
25,26	KDT2,3	I	Key data input
27	NC		Not used
28	KST4	O	Key strobe output
29-32	NC		Not used
33-55	SEG35-13	O	LCD segment output
56	VDD		Power supply
57-64	SEG12-5	O	LCD segment output

* PD6340A

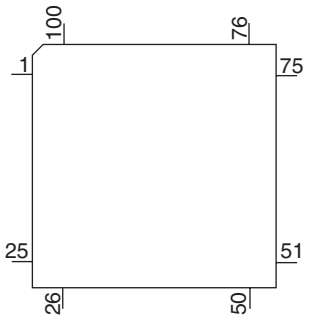


● Pin Functions (PE5497B)

Pin No.	Pin Name	I/O	Function and Operation
1	LD	O	Laser diode control current output
2	PD	I	Photo diode signal (for detecting laser power) input
3	$\overline{\text{RST}}$	I	Reset (CD block)
4	INTQ	O	Interrupt
5	A0	I	Address 0
6	$\overline{\text{STB}}$	I	Strobe
7	$\overline{\text{SCK}}$	I	Serial clock
8	SO	O	Serial data output
9	SI	I	Serial data input
10	D.VDD		Power supply for digital circuits
11	D.GND		Ground for digital circuits
12	REG16		Capacitor connection for regulator (logic)
13	REGS		Capacitor connection for regulator (SRAM)
14	DA.VDD		Power supply for Audio-DAC
15	ROUT	O	R-channel audio signal output
16	DA.GND		Ground for Audio-DAC
17	REGC		Capacitor connection for regulator (RF amp.)
18	DA.GND		Ground for Audio-DAC
19	LOUT	O	L-channel audio signal output
20	DA.VDD		Power supply for Audio-DAC
21	ICEMD	I	Selected to ICE
22	X.VDD		Power supply for the crystal oscillator
23	$\overline{\text{XTAL}}$	O	Crystal connection
24	X.GND		Ground for the crystal oscillator
25	XTAL	I	Crystal connection
26	VPP	I	Programming power supply
27	C.VDD		Power supply for digital circuits(Power supply for the CPU)
28	C.GND		Ground for digital circuits(Ground for the CPU)
29	RESET	I	Reset
30	IO.GND		Ground for the digital port
31	IO.VDD		Power supply for the digital port
32	ICECK	O	Clock for ICE
33	INT0	I	Interrupt
34	INT2	I	Interrupt
35-42	PA0-7	I/O	General port A
43	DOUT	O	Data output (audio)
44	SCKO	O	Serial clock output (audio)
45	LRCK	O	LR clock (audio)
46	TX/EMPH	O	Transmit data/Emphasis information output
47-54	PC0-7	I/O	General port C
55-62	PB0-7	I/O	General port B
63	SD2	O	Sled drive
64	IO.GND		Ground for the digital port
65	IO.VDD		Power supply for the digital port
66	FD	O	Focus drive output (PWM)
67	TD	O	Tracking drive
68	SD	O	Sled drive
69	MD	O	Motor drive output (PWM)
70	TEST	I	Test
71	AD.GND		Ground for the A/D converter
72	AD.VDD		Power supply for the A/D converter
73	EFM	O	EFM signal

Pin No.	Pin Name	I/O	Function and Operation
74	ASY	I	Slice level
75	ATEST	O	Analog test
76	A.VDD		Power supply for the analog system
77	A.GND		Ground for the analog system
78	RFI	I	RF signal input
79	AGCO	O	AGC amp output
80	C3T		Capacitance connection for 3T signal detecting circuit
81	AGCI	I	AGC amp input
82	RFO	O	RF amp output
83	EQ2		Equalizer parts connection for RF amp
84	EQ1		Equalizer parts connection for RF amp
85	RF2-	I	Impedance connection to RF amp for negative feedback
86	RF-	I	Impedance connection to RF amp for negative feedback
87	A.GND		Ground for the analog system
88	A.VDD		Power supply for the analog system
89	A	I	Error signal input
90	B	I	Error signal input
91	F	I	Error signal input
92	E	I	Error signal input
93	REFOUT	O	Reference output
94	FE-	I	Impedance connection to focus error amp for negative feedback
95	FEO	O	Focus error amp output
96	ADCIN	I	A/D converter input
97	TE-	I	Impedance connection to tracking error amp for negative feedback
98	TEO	O	Tracking error amp output
99	TE2	O	Tracking error amp output multiplied by two
100	TEC	I	Tracking error comparator

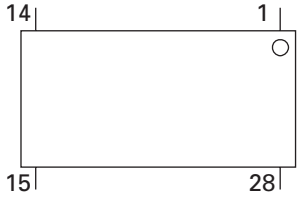
* PE5497B



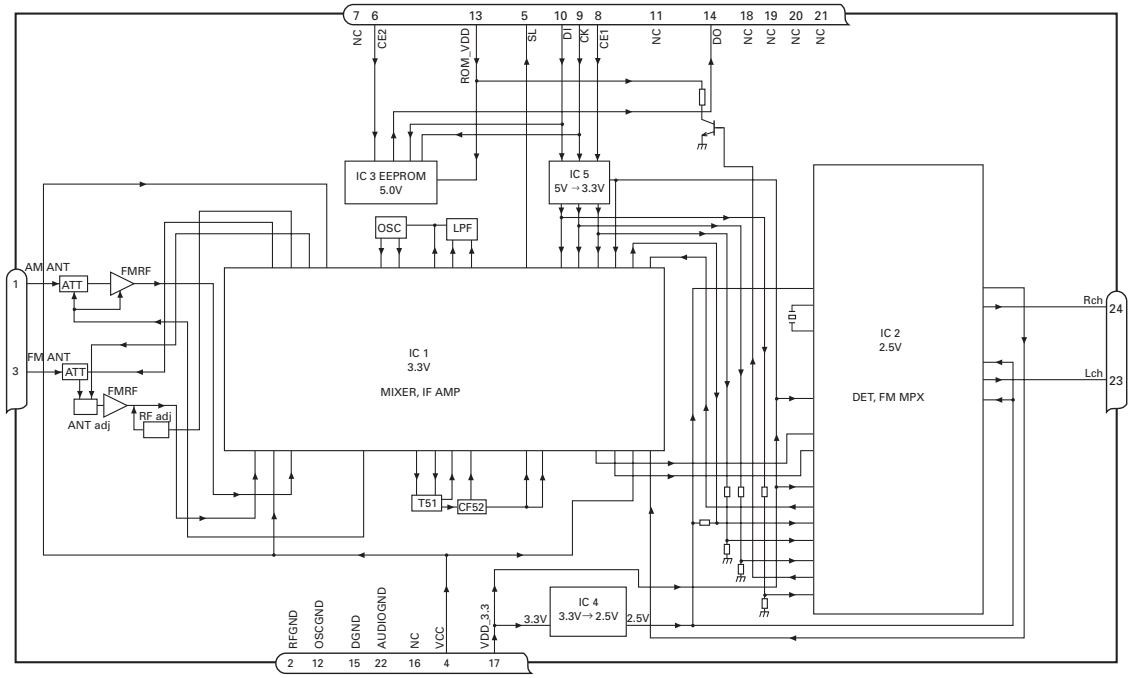
● Pin Functions(BA5839FP)

Pin No.	Pin Name	Function and Operation
1	VR	Input pin for reference voltage
2	OPIN2(+)	Input pin for non-inverting input for CH2 preamplifier
3	OPIN2(-)	Input pin for inverting input for CH2 preamplifier
4	OPOUT2	Output pin for CH2 preamplifier
5	OPIN1(+)	Input pin for non-inverting input for CH1 preamplifier
6	OPIN1(-)	Input pin for inverting input from CH1 preamplifier
7	OPOUT1	Output pin for CH1 preamplifier
8	GND	Ground pin
9	MUTE	Mute control pin
10	POWVCC1	Power supply pin for CH1, CH2, and CH3 at "Power" stage
11	VO1(-)	Driver CH1 - Negative output
12	VO1(+)	Driver CH2 - Positive output
13	VO2(-)	Driver CH2 - Negative output
14	VO2(+)	Driver CH2 - Positive output
15	VO3(+)	Driver CH2 - Positive output
16	VO3(-)	Driver CH2 - Negative output
17	VO4(+)	Driver CH4 - Positive output
18	VO4(-)	Driver CH4 - Negative output
19	POWVCC2	Power supply pin for CH4 at "Power" stage
20	GND	Ground pin
21	CNT	Control pin
22	LDIN	Loading input
23	OPOUTSL	Output pin for preamplifier for thread
24	OPINLSL	Input pin for preamplifier for thread
25	OPOUT3	CH3 preamplifier output pin
26	OPIN3(-)	Input pin for inverting input for CH3 preamplifier
27	OPIN3(+)	Input pin for non-inverting input for CH3 preamplifier
28	PREVCC	PreVcc

BA5839FP



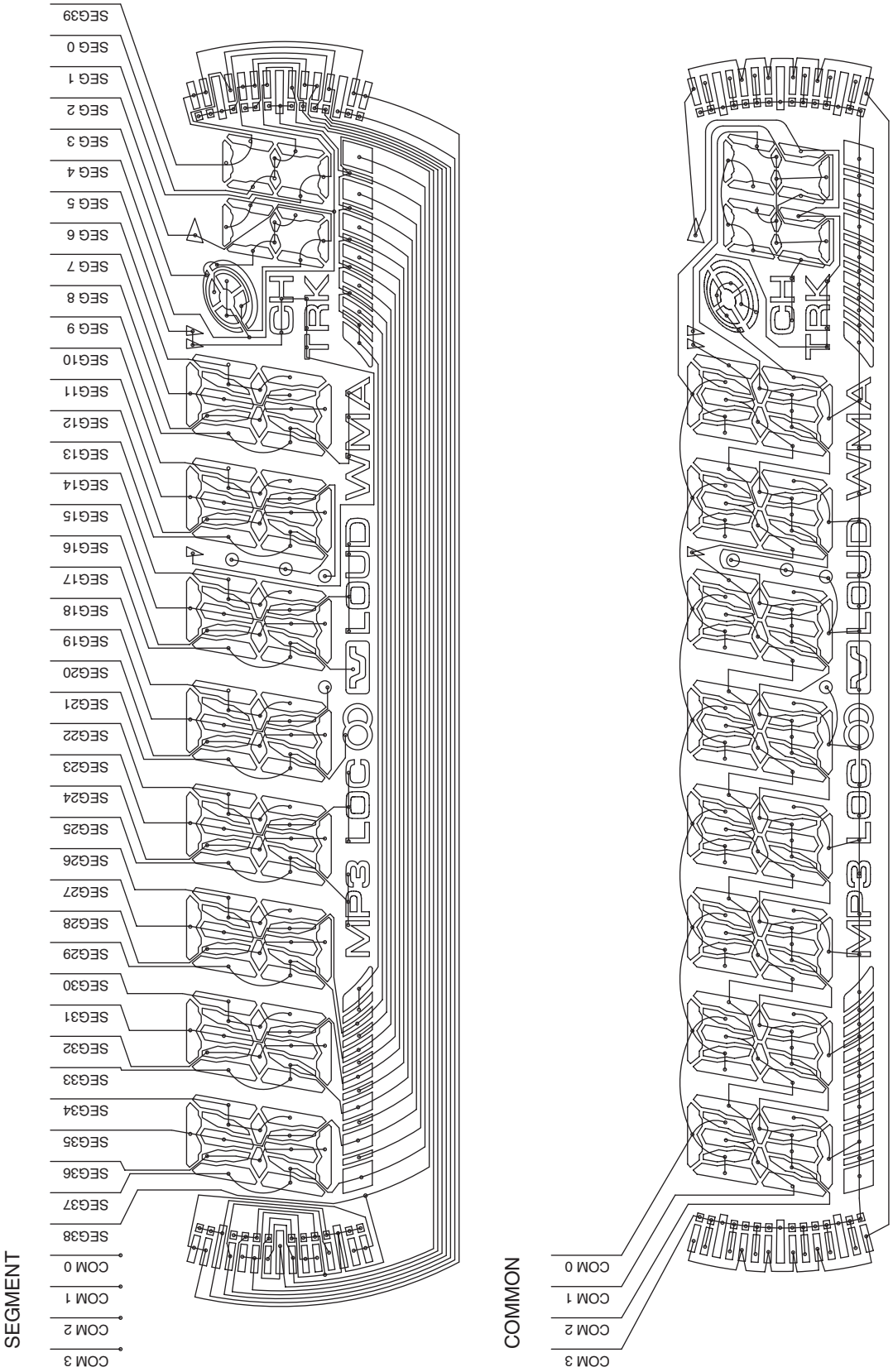
● FM/AM Tuner Unit



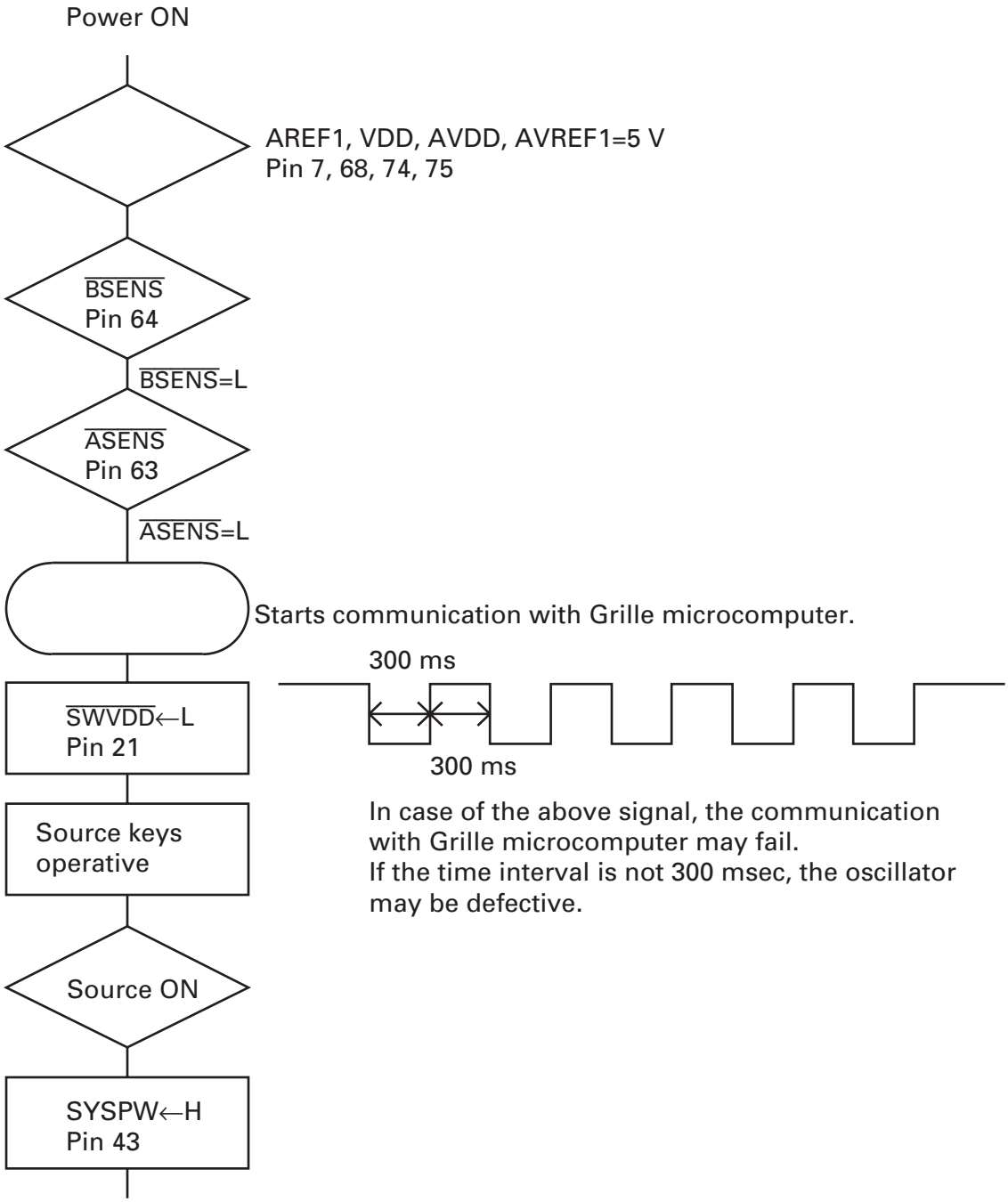
No.	Symbol	I/O	Explain	
1	AMANT	I	AM antenna input	AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7μH. (LAU type inductor) A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the hum of power transmission line.
2	RFGND		RF ground	Ground of antenna block
3	FMANT	I	FM antenna input	Input of FM antenna 75Ω Surge absorber(DSP-201M-S00B) is necessary.
4	VCC		power supply	The power supply for analog block. D.C 8.4V ± 0.3V
5	SL	O	signal level	Output of FM/AM signals level
6	CE2	I	chip enable-2	Chip enable for EEPROM "Low" active
7	NC		non connection	Not used
8	CE1	I	chip enable-1	Chip enable for AF•RF "High" active
9	CK	I	clock	Clock
10	DI	I	data in	Data input
11	NC		non connection	Not used
12	OSCGND		osc ground	Ground of oscillator block
13	ROM_VDD		power supply	Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out	Data output
15	DGND		digital ground	Ground of digital block
16	NC		non connection	Not used
17	VDD_3.3		power supply	The power supply for digital block. 3.3V ± 0.2V
18	NC		non connection	Not used
19	NC		non connection	Not used
20	NC		non connection	Not used
21	NC		non connection	Not used
22	AUDIOGND		audio ground	Ground of audio block
23	L ch	O	L channel output	FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output	FM stereo "R-ch" signal output or AM audio output

7.2.2 DISPLAY

● **LCD(CAW1905)**

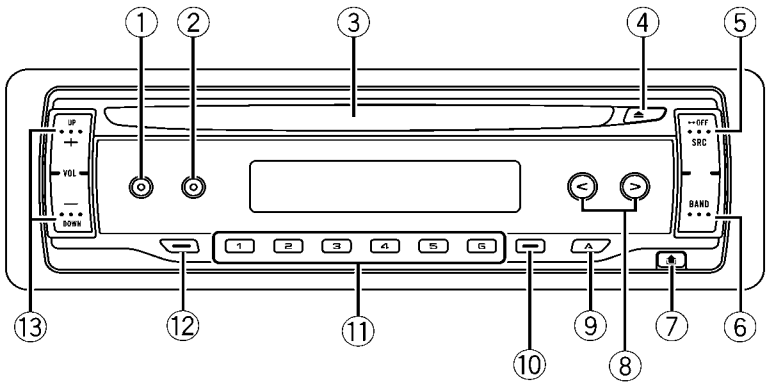


7.3 OPERATIONAL FLOW CHART



Completes power-on operation.(After that, proceed to each source operation.)

8. OPERATIONS



Head unit

① **EQ button**
Press to select various equalizer curves.

② **LOUDNESS button**
Press to turn loudness on or off.

③ **Disc loading slot**
Insert a disc to play.

④ **EJECT button**
Press to eject a CD from your built-in CD player.

⑤ **SOURCE button**
This unit is turned on by selecting a source. Press to cycle through all the available sources.

⑥ **BAND button**
Press to select among three FM bands and one AM band and to cancel the control mode of functions.

⑦ **DETACH button**
Press to remove the front panel from the head unit.

⑧ **◄/► buttons**
Press to perform manual seek tuning, fast forward, reverse and track search controls. Also used for controlling functions.

⑨ **AUDIO button**
Press to select various sound quality controls.

⑩ **LOCAL/BSM button**
Press to turn local function on or off.
Press and hold to turn BSM function on or off.

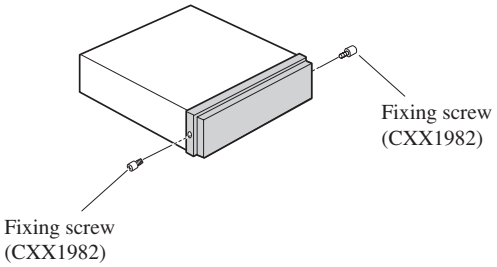
⑪ **1–6 buttons**
Press for preset tuning. Also used for controlling functions.

⑫ **CLOCK button**
Press to change to the clock display.

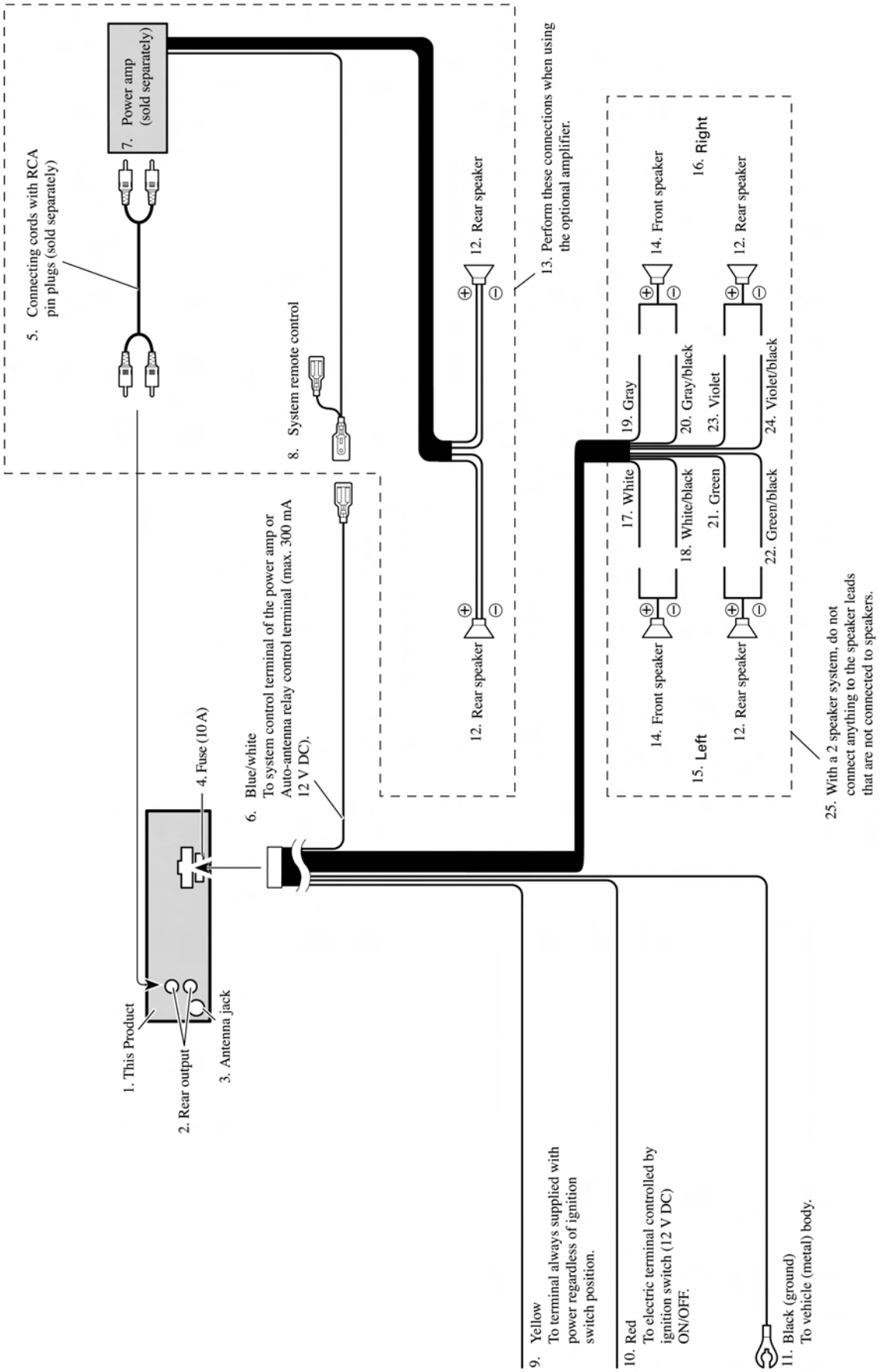
⑬ **VOLUME (+/–) buttons**
Press to increase or decrease the volume. ▣

About the fixing screws for the front panel

If you do not operate the Detaching and Replacing the Front Panel Function, use the supplied fixing screws and fix the front panel to this unit.



●CONNECTION DIAGRAM



● Jigs List

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

● Grease List

Name	Grease No.	Remarks
Grease	GEM1024	CD Mechanism Module
Grease	GEM1045	CD Mechanism Module

Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

Pioneer sound.vision.soul

Service Manual

ORDER NO.
CRT3582

CD MECHANISM MODULE(S10.5STD)

CX-3166

This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.
When performing repairs use this manual together with the specific manual for model under repair.

Model	Service Manual	CD Mechanism Module
DEH-1850/XN/ES	CRT3552	CXK5701
DEH-1800R/XN/EW DEH-1820R/XN/EW	CRT3553	CXK5701

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936

K-ZZA. OCT. 2005 Printed in Japan

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1. CIRCUIT DESCRIPTIONS

The recent mainstay of the CD LSI is the LSI integrating the core DSP with DAC or RF amplifier, which are generally employed as peripheral circuits, however, PE5497B, used in this product, is an LSI integrating the afore-mentioned LSI unit and microcomputer unit in one chip.

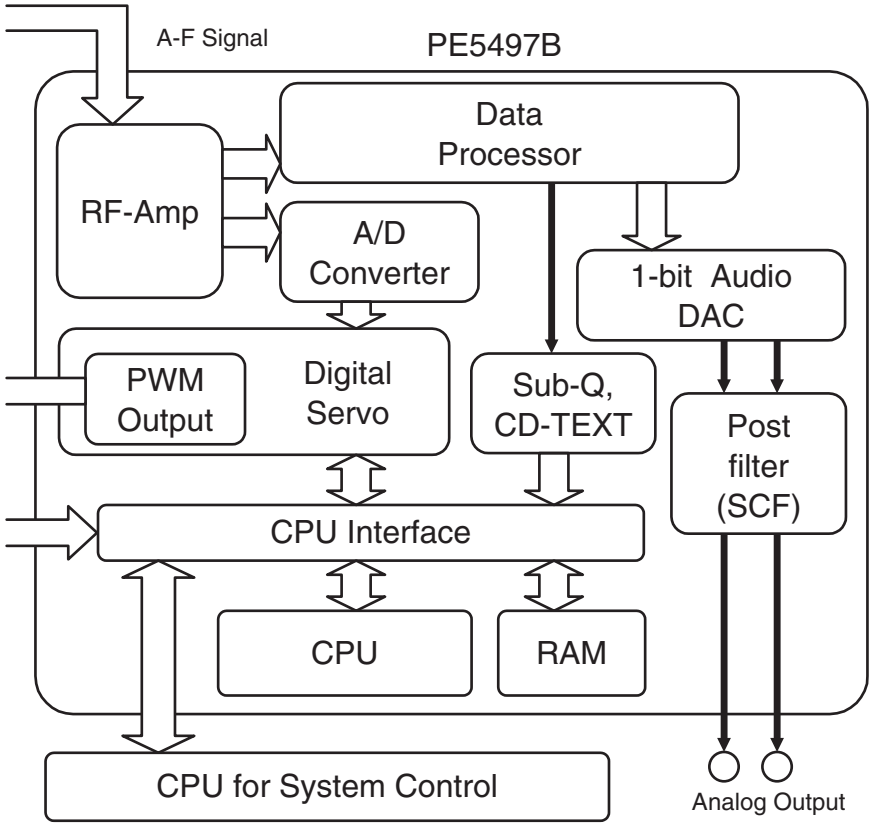


Fig.1.0.1 Block diagram of PE5497B

1.1 PREAMPLIFIER BLOCK (PE5497B: IC201)

In the preamplifier block, the pickup output signals are processed to generate signals that are used in the subsequent blocks: servo, demodulator, and control blocks. Signals from the pickup are I/V converted in the pickup with the preamplifier with built-in photo detectors, and after added with the RF amplifier, they are used to produce such signals as RF, FE, TE, and TE zero-cross signals. The preamplifier block is built in CD LSI PE5497B (IC201), whose parts are described individually below. Incidentally, as this LSI employs a single power supply (+ 3.3 V) specification, the reference voltages of this LSI and the pickup are the REFO (1.65 V) for both. The REFO is an output obtained from REFOUT in the LSI via the buffer amplifier, and is output from the pin 93 of this LSI. All measurements will be performed with this REFO as the reference.

Caution: Be careful not to short-circuit the REFO and GND when measuring.

1.1.1 APC (Automatic Power Control) circuit

Since laser diodes have extremely negative temperature characteristics in optical output when driven in constant current, it is necessary to control the current with the monitor diodes in order to keep the output constant. This is the feature of the APC circuit. The LD current is obtained by measuring the voltage between LD1 and VDD(+ 3.3 V), and divide the value by 7.5 (ohms), which becomes about 30 mA.

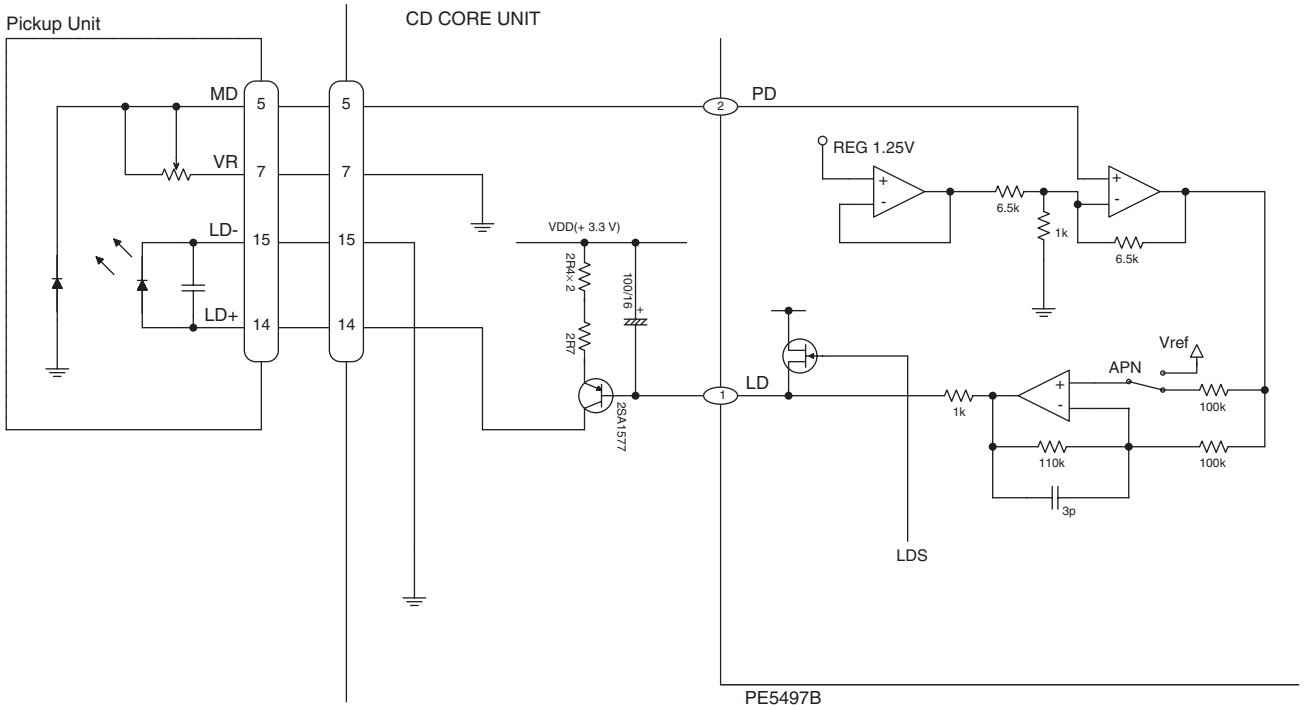


Fig.1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The output from the photo-detector (A + C) and (B + D) is provided from the RFO terminal as the RF signal (which can be used for eye-pattern check), after it is added, amplified, and equalized inside this LSI. The low frequency component of the voltage RFO is calculated as below.

RFO = (A + B + C + D) x 2

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFO signal, output from the pin 82, is A/C-coupled externally, input to the pin 81, and amplified in the RFAGC amplifier to obtain the RFAGC signal.

Also, this LSI is equipped with the RFAGC auto-adjustment function, explained below, which switches feedback gains of the RFAGC amplifier so that the RFO output will be 1.5 V.

This RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

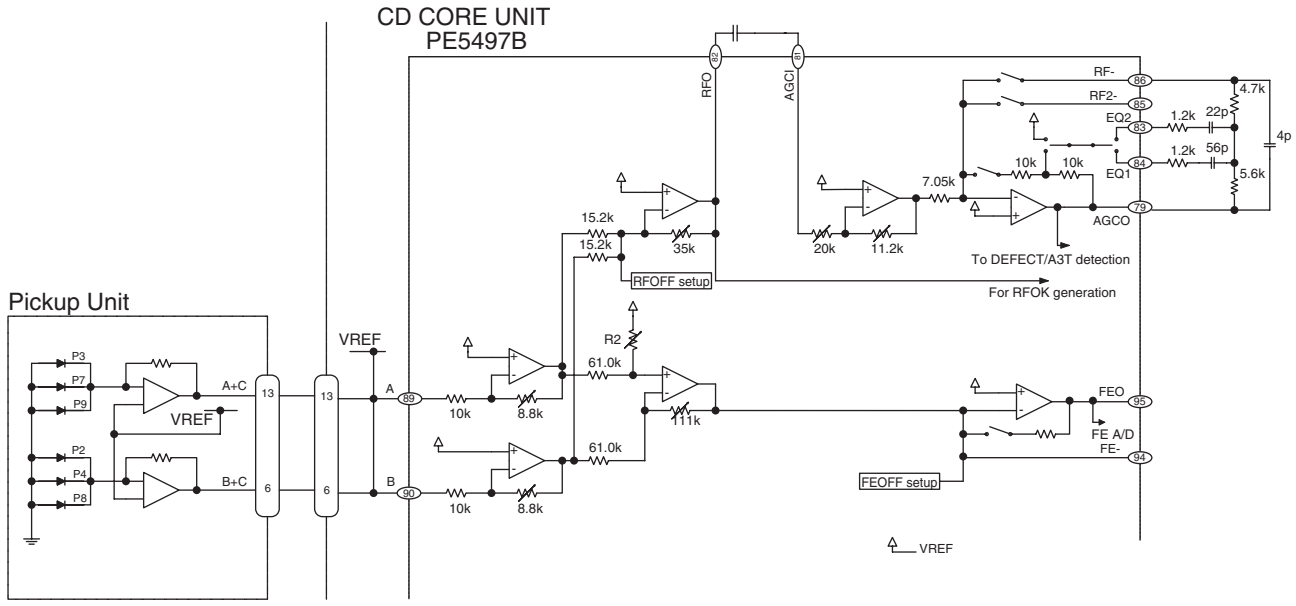


Fig.1.1.2 RF/AGC/FE

1.1.3 Focus error amplifier

The photo-detector outputs (A + C) and (B + D) are passed through the differential amplifier and the error amplifier, and (A + C - B - D) is provided from the pin 95 as the FE signal.The low frequency component of the voltage FE is calculated as below.

FE = (A + C - B - D) x 8.8k / 10k x 111k / 61k x 160k / 72k

= (A + C - B - D) x 3.5

For the FE outputs, an S-shaped curve of 1.5 Vp-p is obtained with the REFO as the reference. The cutoff frequency for the subsequent stage amplifiers is 14.6 kHz.

1.1.4 RFOK circuit

This circuit generates the RFOK signal, which indicates the timing to close the focus loop and focus-close status during the play mode, from the pin 62. As for the signal, "H" is output in closing the focus loop and during the play mode.

Additionally, the RFOK becomes "H" even in a non-pit area, since the DC level of the RFO signal is peak-held in the subsequent digital block and compared at a certain threshold level to generate the RFOK signal. Therefore, the focus is closed even on a mirror-surface area of a disc. This signal is also supplied to the microcomputer via the low-pass filer as the FOK signal, which is used for protection and gain switching of the RF amplifier.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are passed through the differential amplifier and the error amplifier to obtain (E - F), and then provided from the pin 98 as the TE signal. The low frequency component of the voltage TE is calculated as below.

TEO = (E - F) x 63k / 112k x 160k / 160k x 181k / 45.4k x 160k / 80k

= (E - F) x 4.48

For the TE output, TE waveform of about 1.3 Vp-p with the REFO as the reference. The cutoff frequency in the subsequent is 21.1 kHz.

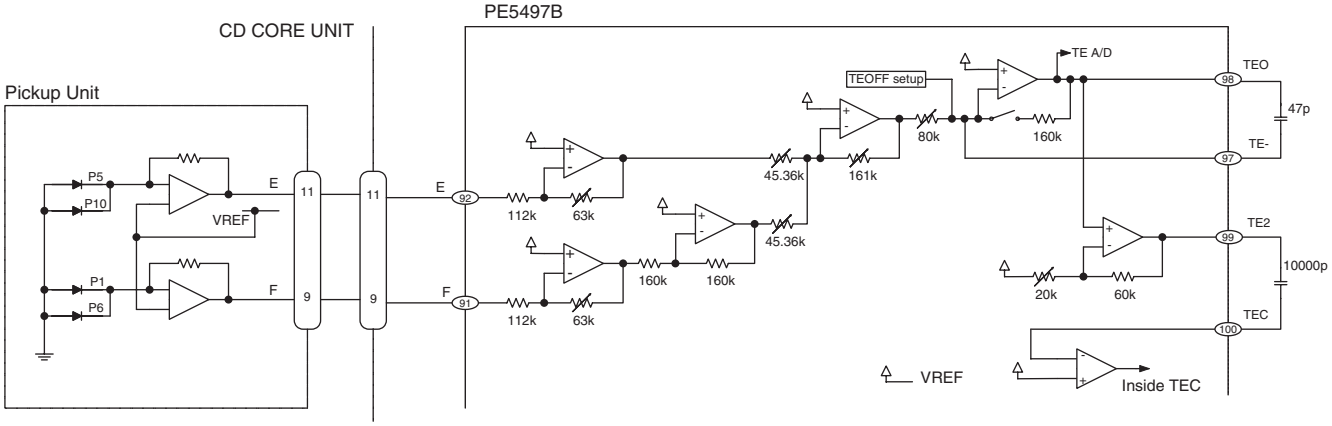


Fig.1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter referred to as TEC signal) is obtained by amplifying the TE signal by fourfold, and used to detect the tracking-error zero-cross point. As the purpose of detecting the zero-cross point, the following two points can be named:

1. To use for track-counting in the carriage move and track jump modes
2. To use for detecting the direction in which the lens moves in tracking close. (Used in the tracking brake circuit to be explained later.)

The frequency range of the TEC signal is from 300 Hz to 20 kHz, and

TEC voltage = TE level x 4

The TEC level can be calculated at 4.62V, which, at this level, exceeds the D range of the operational amplifier, and clips the signal, but, because the CD LSI only uses the signal at the zero-cross point, it poses no particular problem.

1.1.7 EFM circuit

The EFM circuit converts the RF signal into digital signals of 0 and 1. The AGCO signal output from the pin 79 is A/C-coupled externally, input to the pin 78, and supplied to the EFM circuit.

Missing RF signal due to scratches and stains on the disc, and asymmetry of the upper and lower parts of the RF, caused by variation in disc production, cannot be entirely eliminated in AC coupling process, the reference voltage ASY of the EFM comparator is controlled, using the probability that 0 and 1 occur at 50%. Thus, the comparator level will always stay around the center of the RFO signal. This reference voltage ASY is generated by passing the EFM comparator output through the low-pass filter. The EFM signal is output from the pin 73.

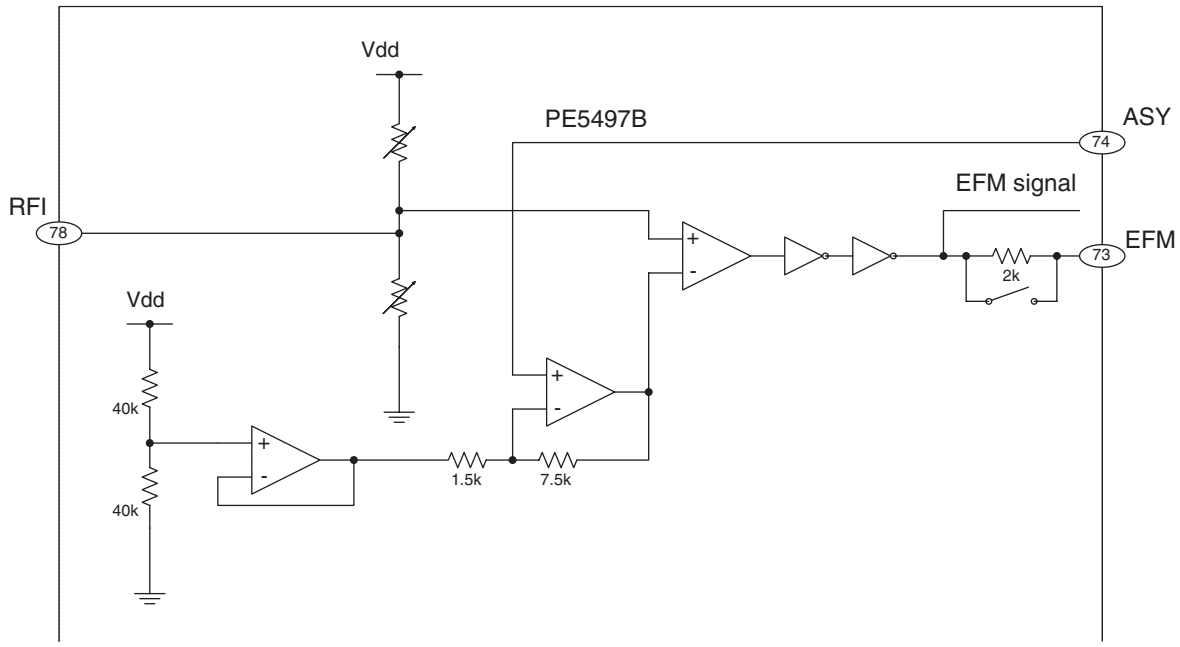


Fig.1.1.4 EFM

1.2 SERVO BLOCK (PE5497B: IC201)

The servo block performs servo control such as error signal equalizing, in-focus, track jump and carriage move. The DSP block is the signal-processing unit, where data decoding, error correction, and compensation are performed. The FE and TE signals, generated in the preamplifier stage, are A/D-converted, and output drive signals for the focus, tracking, and carriage systems via the servo block. Also, the EFM signal is decoded in the signal-processing unit, and ends up in outputting D/A-converted audio signals through the D/A converter. Furthermore, in this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to output the spindle drive signal.

Each drive signal for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are output as PWM3 data, and then converted to analog data through the LPF. These drive signals, after changed to analog form, can be monitored with the FIN, TIN, CIN, and SIN signals, respectively. Subsequently, the signals are amplified and supplied to the actuator and motor for each signal.

1.2.1 Focus servo system

The main equalizer of the focus servo consists of the digital equalizer block. The figure 1.2.1 shows the block diagram of the focus servo system.

In the focus servo system, it is necessary to move the lens within the in-focus range in order to close the focus loop. For that purpose, the in-focus point is looked for by moving the lens up and down with the focus search voltage of triangular signal. During this time, the rotation of the spindle motor is retained at a certain set speed by kicking the spindle motor.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus-close operations at an appropriate timing. The focus-close operation is performed when the following three conditions are satisfied at the same time:

1) The lens moves toward the disc surface.
2) RFOK = "H"
3) The FE signal is zero-crossed.

Consequently, the FE converges to "0" (= REFO).

When the above-mentioned conditions are met and the focus loop is closed, the FSS bit is shifted from "H" to "L," and then, in 10 ms, the CPU unit of the LSI starts monitoring the RFOK signal obtained through the low-pass filter.

If the RFOK signal is determined to be "L," the CPU unit of the LSI takes several actions including protection.

Fig.1.2.2 shows a series of actions concerning the focus close operations. (It shows a case where the focus loop cannot be closed.)

With the focus mode selector displaying 01 in the test mode, pressing the focus close button, allows to check the S-shaped curve, search voltage, and actual lens behavior.

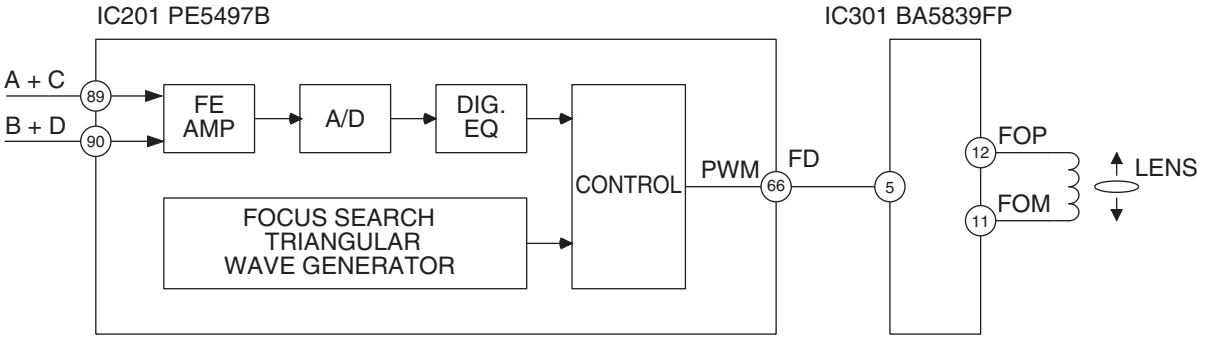


Fig.1.2.1 Block diagram of the focus servo system

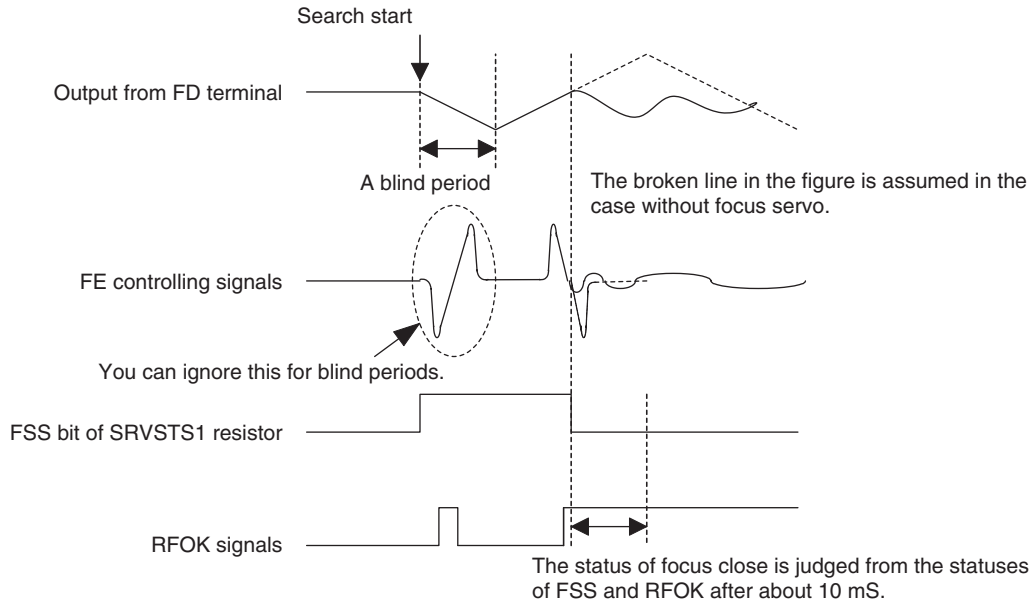


Fig.1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

The main equalizer of the tracking servo consists of the digital equalizer block. The figure 1.2.3 shows the block diagram of the focus servo system.

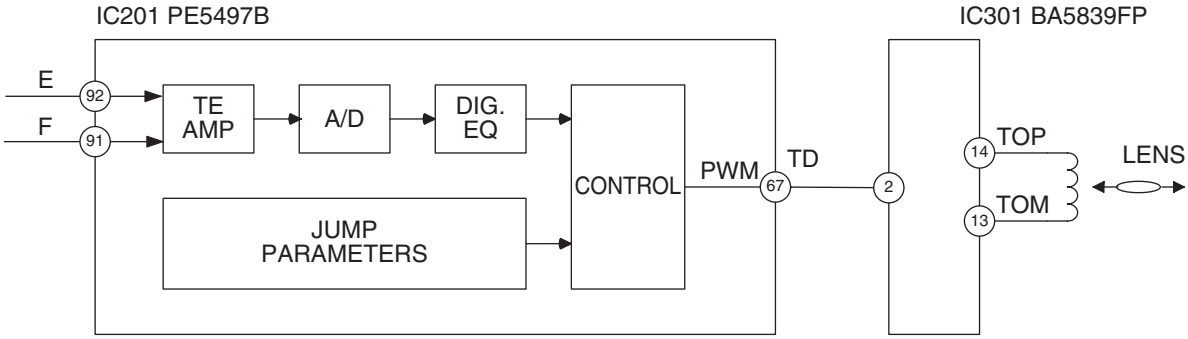


Fig.1.2.3 Block diagram of the tracking servo system

(a) The track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the CPU unit of the LSI. For the track jumps used in the search mode, a single-track jump and four to 100 multi-track jump are available in this system. In the test mode, out of these track jumps, 1, 32, and 32 * 3 track jumps, as well as carriage move can be performed and checked in mode selection. In a track jump, the CPU unit of the LSI sets about half the number of the total tracks to jump (about five tracks for a 10-track jump), and the set number of tracks are counted using the TEC signal. By outputting the brake pulse for a certain period of time (set by the CPU unit of the LSI) from the time the set number is counted, and stopping the lens, the tracking loop can be closed so that the normal play can be continued.

Also, in order to facilitate closing of the tracking loop in a track jump, the brake circuit is kept ON for 50msec, after the brake pulse is stopped, for increasing the tracking servo gain. The FF/REW action in the normal operation mode is realized by performing single jumps consecutively. The speed is approximately 10 times faster than in the normal mode.

(b) Brake circuit

Since the servo loop is not closed very well in the setup mode and track jump mode, the brake circuit is used for stabilizing the servo-loop close operation. The brake circuit detects the direction in which the lens moves, and outputs only the drive signal for the direction opposite to the movement to slow down the lens, thereby stabilizing the tracking servo-loop close operation. Additionally, the off-track direction is determined from the TEC and MIRR signals, as well as their phase relation.

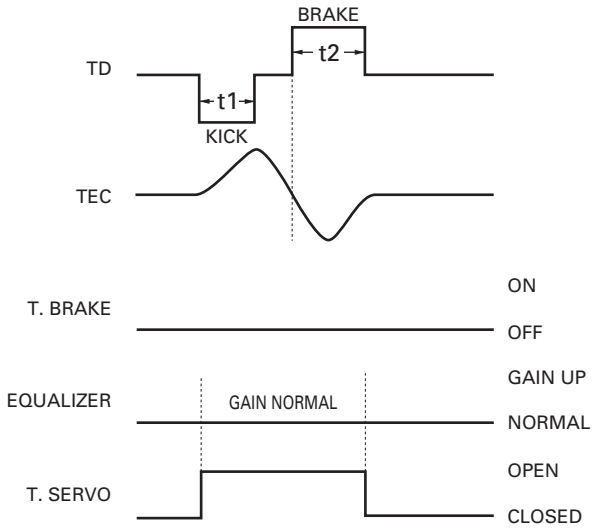


Fig.1.2.4 Single-track jump

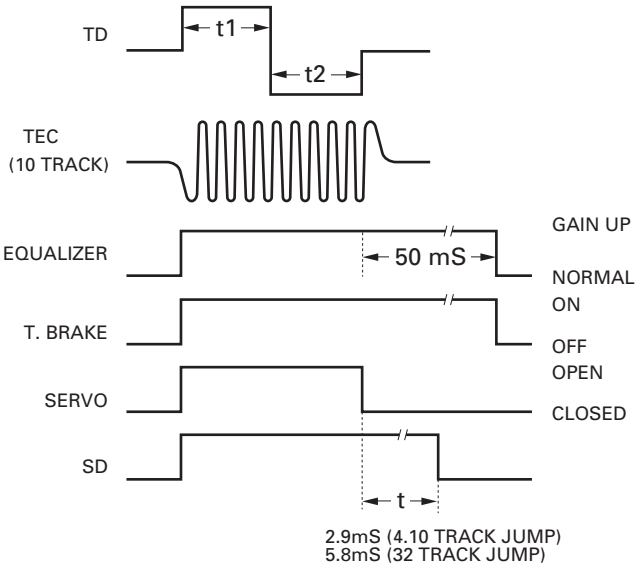
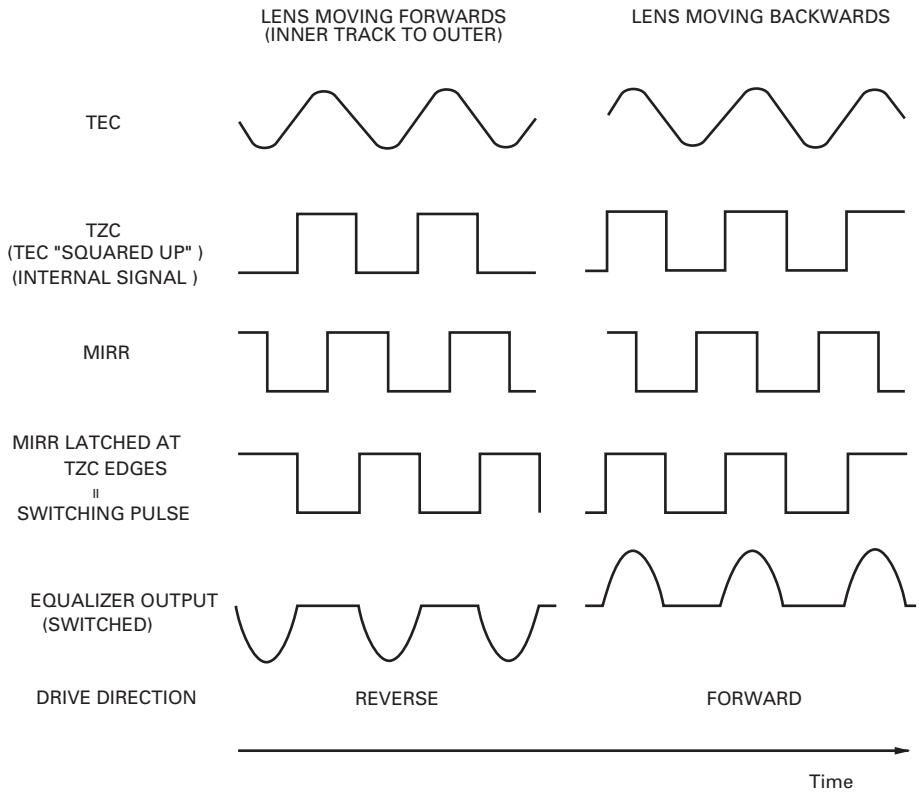


Fig.1.2.5 Multi-track jump



Note : Equalizer output assumed to hava same phase as TEC.

Fig.1.2.6 Track brake

1.2.3 Carriage servo system

The carriage servo system inputs the output of the low frequency component from the tracking equalizer (information on the lens position) to the carriage equalizer, and, after the gain is increased to a certain level, outputs the drive signal from the CD block of the LSI. This signal is applied to the carriage motor via the driver IC.

Specifically, since it is necessary to move the whole pickup to the FORWARD direction when the lens offset reaches a certain level during the play mode, the equalizer gain is set to output higher voltage than the carriage motor starting voltage at this time. In actual operations, a certain threshold level is preset in the servo LSI for the equalizer output, and only when it exceeds the threshold level, the drive voltage will be output. This can reduce the power consumption. Also, before the whole pickup starts moving, the equalizer output voltage may exceed the threshold level a few times, due to such causes as eccentricity of discs. In this case, the output waveform of the drive voltage from the CD block of the LSI assumes a pulse-like form.

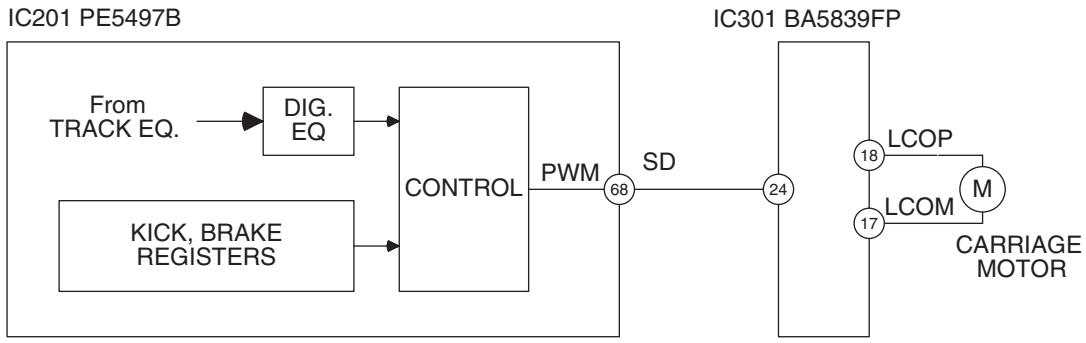


Fig.1.2.7 Block diagram for the carriage servo block

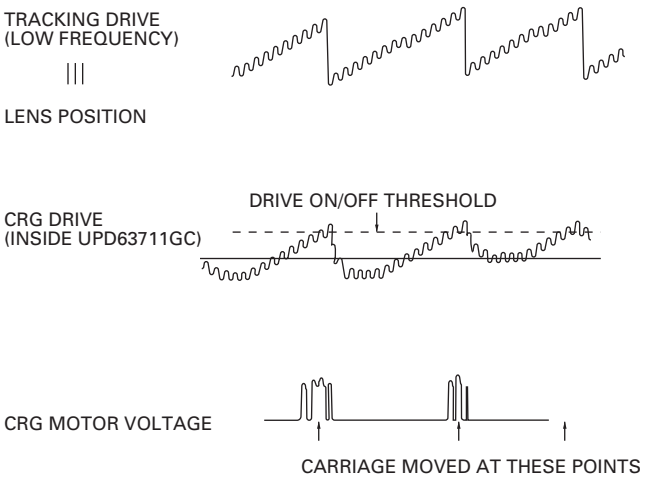


Fig.1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following modes are available:

1) Kick

Used to accelerate the disc rotation in the setup mode.

2) Offset

a. Used in the setup mode after the kick mode, until the TBAL adjustment is completed.

b. Used during the play mode when the focus loop is unlocked, until it is locked again.

In both cases, the mode is used to keep the disc rotation approximately normal.

3) Applicable servo

CLV servo mode, used in the normal operation.

In the EFM demodulation block, by WFCK/16 sampling whether the frame sync signal and the internal frame counter output are synchronized, a signal is created to show if they are "in-sync" or "non-sync." The status is not recognized as asynchronous until the signal is "non-sync" for eight consecutive times; otherwise it is recognized as synchronous. In the applicable servo mode, the leading-in servo mode is automatically selected in the asynchronous status, and the normal servo mode in the synchronous status.

4) Brake

Used to stop the spindle motor.

In accordance with the CPU unit of the LSI, the brake voltage is sent out from the servo LSI. At this time, the EFM waveform is monitored in the CD block of the LSI, and when the longest EFM pattern exceeds a certain interval (or the rotation slows down enough), a flag is set inside the CD block of the LSI, and the CPU unit of the LSI switches off the brake voltage. If a flag is not set within a certain period, the CPU unit of the LSI shifts the mode from the brake mode to the stop mode, and retains the mode for a certain period of time. If the mode switches to this stop mode in the eject operation, the disc will be ejected after the period of time mentioned above elapses.

5) Stop

Used when the power is turned on and during the eject operation. In the stop mode, the voltage in both ends of the spindle motor is 0V.

6) Rough servo

Used in carriage feed (carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, the "H" or "L" level is input to the spindle equalizer. In the test mode, this mode is also used for grating confirmation.

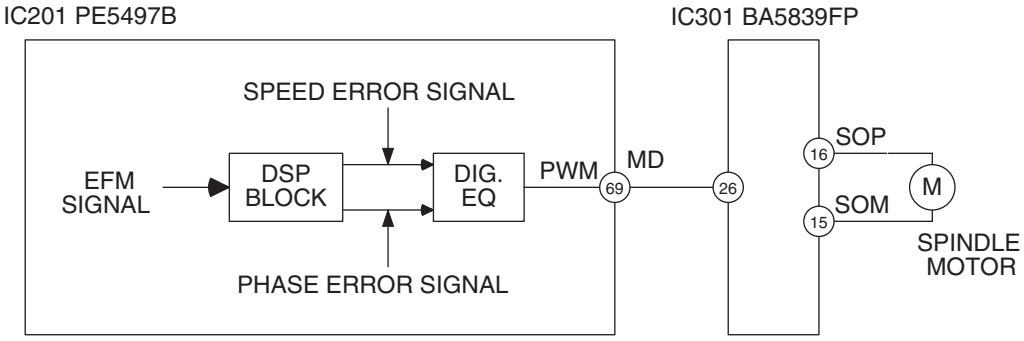


Fig.1.2.9 Block diagram of the spindle servo system

1.3 AUTOMATIC ADJUSTMENT FUNCTION

In this system, all the circuit adjustments are automated in the CD block of the LSI.
All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key.
Details of each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

In this adjustment the TE, FE, and RF amplifier offsets of the preamplifier block in POWER ON are adjusted to the respective target values with the REFO as reference. (The target values for TE, FE, and RF offsets are 0V, 0V, and - 0.8 V, respectively.)
Adjusting procedure
1) The CPU unit of the LSI respective offsets through the CD block of the LSI, when they are in LDOFF status.
2) The CPU unit of the LSI calculates the voltages for correction from the values read in 1), and substitutes the corrected values to prescribed places to adjust.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment is to equalize the pickup output offsets for E-ch and F-ch by changing the amplifier gain in the CD block of the LSI. In actual operation, adjustment is performed so that the TE waveform becomes symmetrical on each side of the REFO.
Adjusting procedure
1) After closing the focus loop,
2) Kick the lens in the radial direction to ensure the generation of the TE waveform.
3) The CPU unit of the LSI reads the TE offset calculated in the LSI through the CD block of the LSI.
4) The CPU unit of the LSI determines the offset amount is 0, positive, or negative.
- When the offset amount is 0, the adjustment is completed.
- When the offset amount is positive or negative, the amp gains for E-ch and F-ch should be changed, following a certain rule.
Then, steps 2) to 4) are repeated until the offset amount becomes 0 or the repetition reaches the limit number of times.

1.3.3 FE bias auto-adjustment

This adjustment is to maximizes the RFO level by optimizing the focus point during the play mode, utilizing the phase difference between the 3T level waveform of the RF waveform and that of when focus error disturbance is input. This adjustment is performed at the same timing as the auto-gain control, which will be described later, since disturbance is input to the focus loop.
Adjusting procedure
1) The CPU unit of the LSI issues the command to introduce disturbance to the focus loop (CD block of the servo LSI).
2) The waver of the 3T component of the RF signal is detected in the CD block of the LSI.
3) The relation between the 3T component above and the disturbance is processed in the CD block of the LSI to detect the volume and direction of the focus offset.
4) The CPU unit of the LSI issues a command and reads out the detected results from the CD block of the LSI.
5) The CPU unit of the LSI calculates the necessary correction and substitutes the result to the bias adjustment term inside the CD block of the LSI.
Additionally, in this adjusting, a series of steps are repeated for better adjustment accuracy, the same as in the auto-gain control.

1.3.4 Focus and tracking AGC

1.3.4 Focus and tracking AGC

This adjustment is to automatically adjust the focus and tracking servo loop gains.

Adjusting procedure

1) Introduce disturbance to the servo loop.

2) The error signals (FE and TE) when disturbance is introduced are extracted through the band pass filter, to obtain the G1 and G2 signals.

3) The CPU unit of the LSI reads G1 and G2 signals via the CD block of the LSI.

4) The CPU unit of the LSI calculates the necessary correction and performs the loop gain adjustment inside the CD block of the LSI.

For increased adjustment accuracy, the same adjustment process is repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment is to adjust the dispersion of the RF level (RFO), which may be caused by mechanism or disc-related factors, to a steady value for reliable signal transmission. The adjustment is performed by changing the amp gain between RFO and RFAGC.

Adjusting procedure

1) The CPU unit of the LSI issues a command and reads out the output from the RF level detection circuit in the CD block of the LSI.

2) From the read values, the CPU unit of the LSI calculates the amp gain to change the RFAGC level to the target.

3) The CPU unit of the LSI sends a command to the CD block of the LSI to adjust the amp gain to the level calculated in 2).

This adjustment is performed

1) when only the focus close operation is completed during the setup mode, and

2) immediately before the setup is completed (or when the play mode is about to start).

1.3.6 Adjustment of gains in preamplifier stage

In this adjustment, when reflected beams from the disc surface are extremely weak, such as when the lens is dirty, or a CD-RW is played, gains in the whole RFAMP block (FE, TE, and RF amplifiers) are increased by + 6 dB or + 12 dB, depending on the situation.

Adjusting procedure

When the system determines that the reflected beams from the disc surface are extremely weak during the setup mode, the whole RFAMP gains will be increased by + 6 dB or + 12 dB.

1.3.7 Initial values in adjustment

All automatic adjustments immediately after inserting a disc are performed based on the initial values. Automatic adjustments by source change or ACC ON are basically performed using the previous adjustment values as the initial values.

1.3.8 Coefficient display of adjustment results

For some of the adjustments (FE and RF offset, FZD cancel, F and T gains, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

The coefficient display in each auto adjustment is as follows:

1) FE and RF offset

Reference value = 32 (coefficient of 32 indicates that no adjustment is required)

The value is displayed in the unit of approximately 32 mV.

Ex. When the FE offset coefficient is 35,

35 - 32 = 3 x 32 mV = 96 mV

The correction is about + 96 mV, which means the FE offset before adjustment is - 96 mV.

2) F and T gain adjustment

Reference value for focus and tracking = 20

The displayed coefficient / the reference value indicates the adjusted gain.

Ex. When the AGC coefficient is 40,

adjustment of 40/20 = 2 times (+ 6 dB) has been performed.

(It means that the original loop gain was half the target, and the whole gain was doubled to obtain the target value.)

3) RF level adjustment (RFAGC)

Reference value = 8

The coefficient of 9 to 15 indicates to increase the RF level

(for more gains).

The coefficient of 7 to 10 indicates to decrease the RF level

(for less gains).

When the coefficient changes by 1, the gain changes by 0.7 to 1 dB.

When the coefficient is 15, the gain is the maximum at TYP + 7.9 dB.

When the coefficient is 0, the gain is the minimum at TYP - 4.6 dB.

1.4 POWER SUPPLY AND LOADING BLOCK

For the power supply for this system, the VD (7.5 ± 0.5 V) and the VDD (3.3 ± 0.165 V), which are supplied from the motherboard, are used. The power supply used in the system, the two power supplies mentioned above, VD (for the drive system), and VDD (LSI power supply: 3.3 V), are used.

The CPU unit of the LSI controls ON/OFF with "CONT", except for Load/Eject of the CD driver. For ON/OFF of the Loading drive, no particular control terminals are available, but the input signal "LOEJ", assumes an equivalent role. Also, the LCO output switches LOADING MODE and CARRIAGE MODE with "CLCONT".

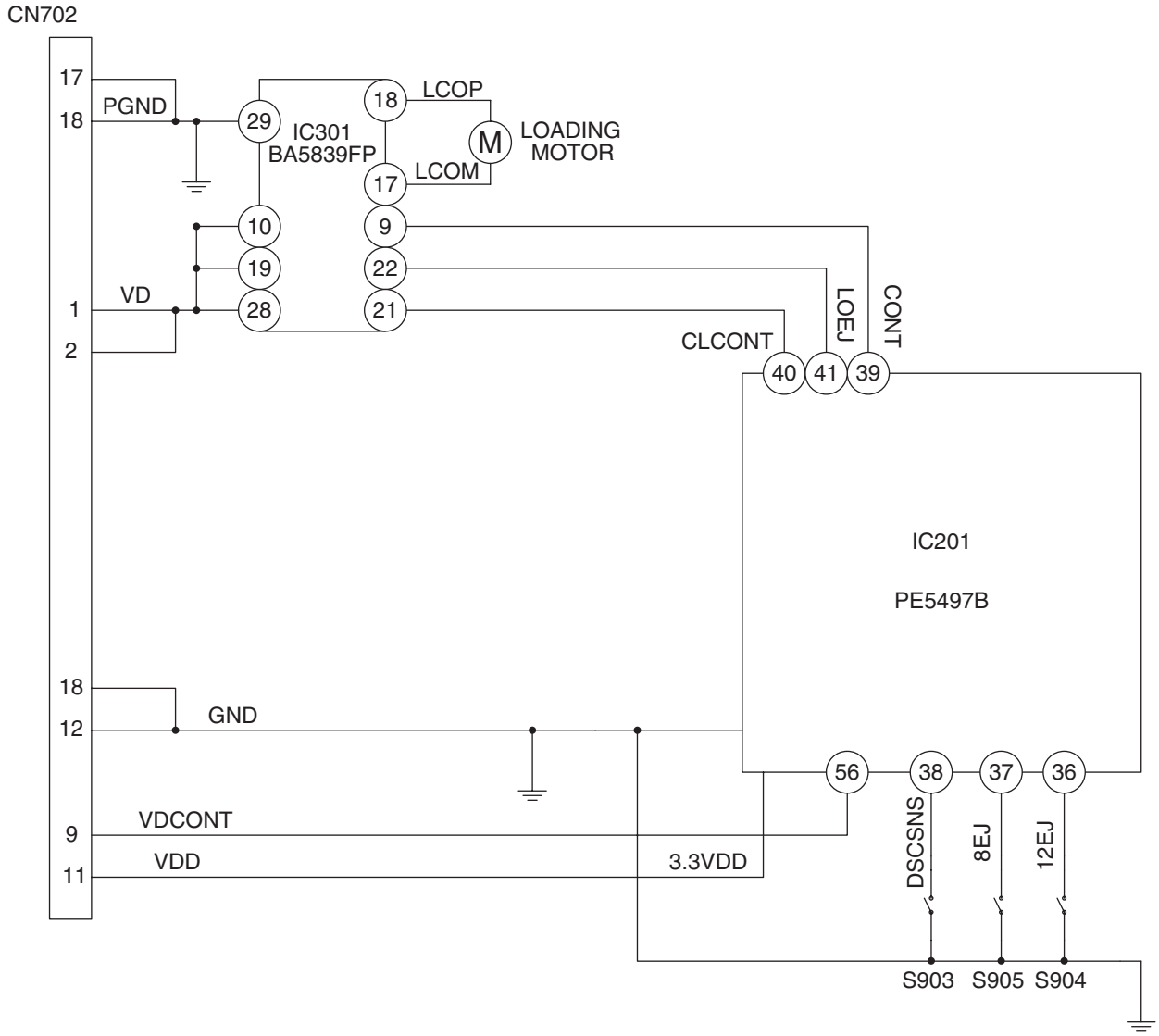


Fig.1.4.1 Power supply/loading system circuit block

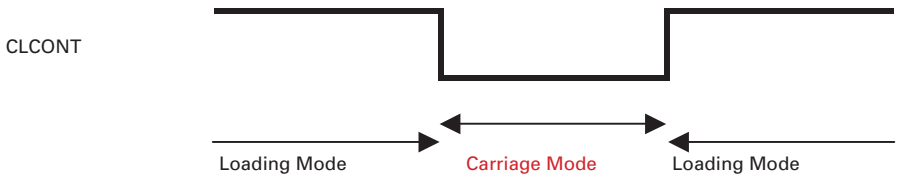


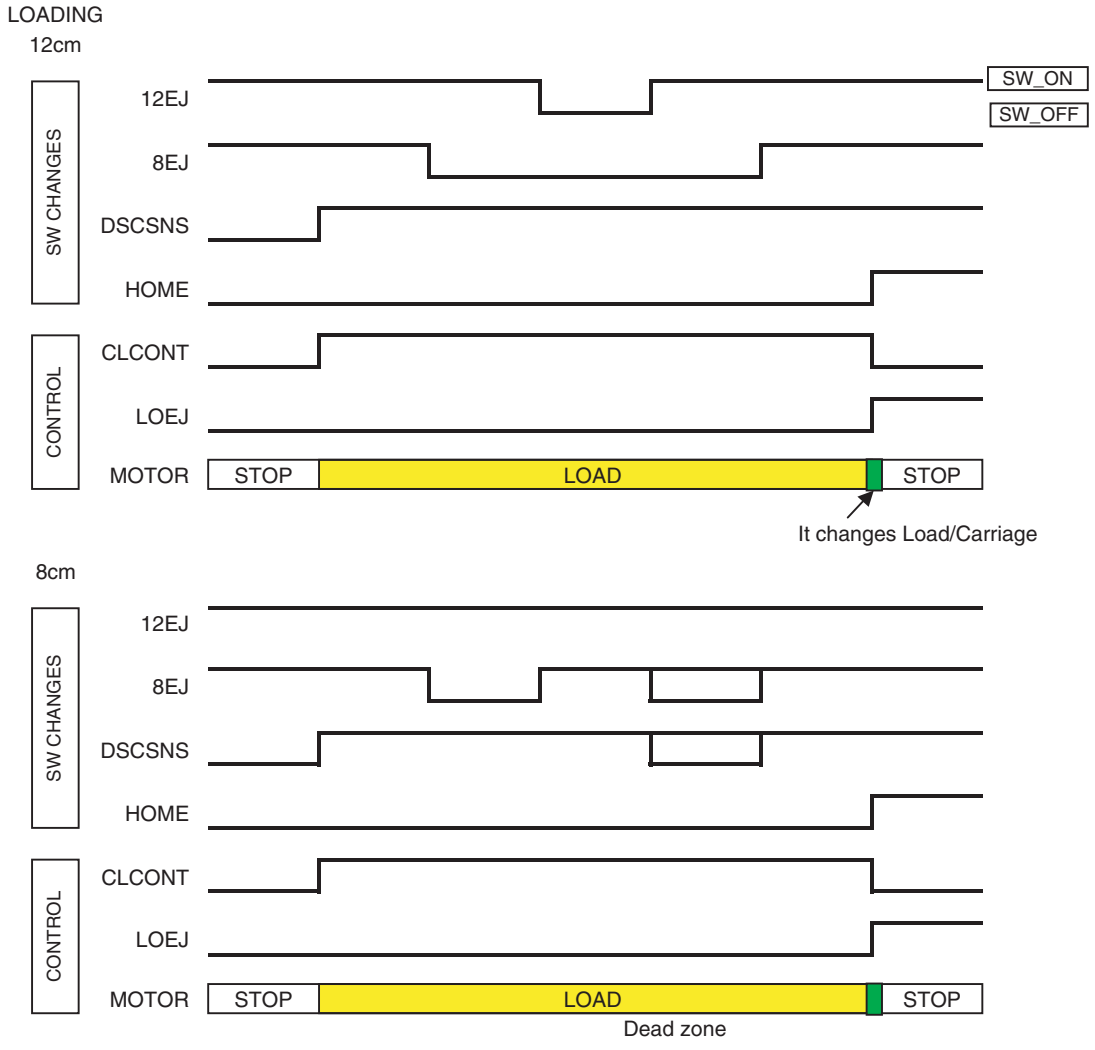
Fig.1.4.2 Loading/carriage mode shift

The load/eject operation is controlled with the status changes of the HOME switch (also used for clamp detection) on the mechanism unit and the three switches on the control unit. The ON/OFF statuses of these switches are respectively detected at the input port of the microcomputer.

Using the detection results in the microcomputer, each status (A to E) is determined. The disc size detection (8 or 12 cm) is also performed through this status change. Each status is shown in Fig.1.4.3 and the status change in Fig.1.4.4.

	Status	A	B	C	D	E
DSCSNS	SW1(S903)	OFF	ON	ON	ON	ON
8SW	SW2(S905)	ON	ON	OFF	OFF	ON
12SW	SW3(S904)	ON	ON	ON	OFF	ON
HOME	SW4(S901)	OFF	OFF	OFF	OFF	ON
	Mechanism state	With no disc				Clamp state

Fig.1.4.3 DSCSNS status



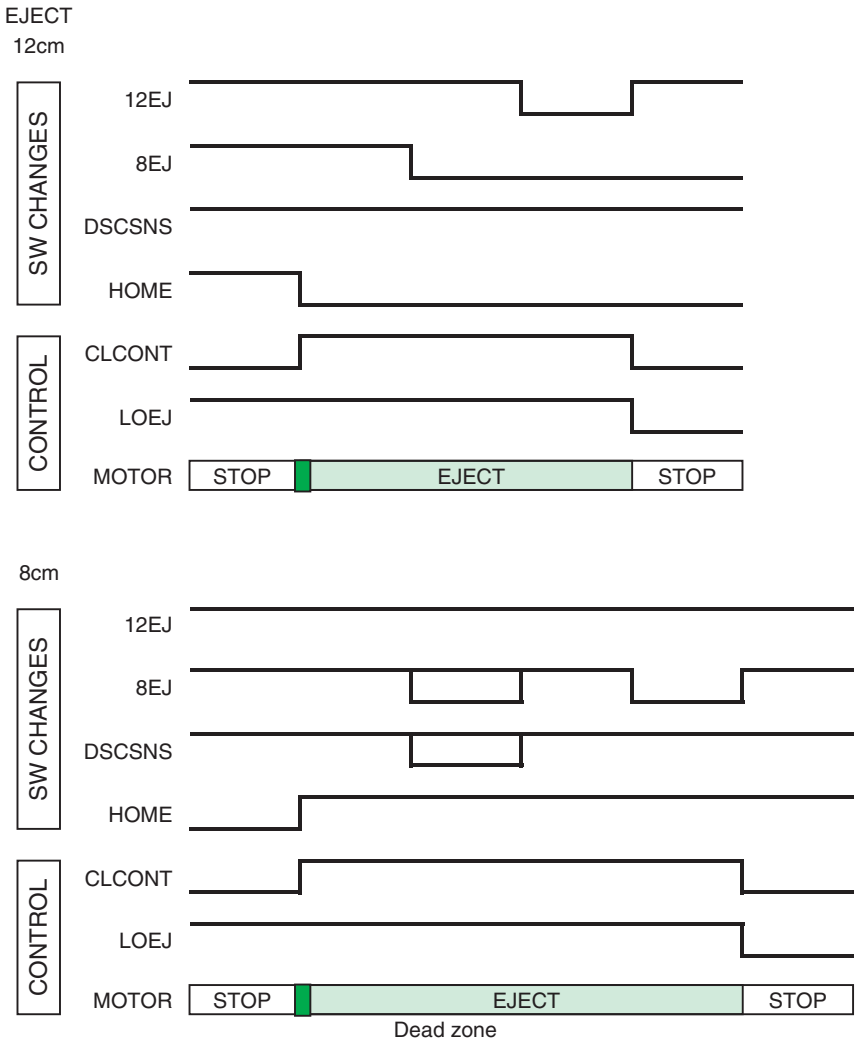
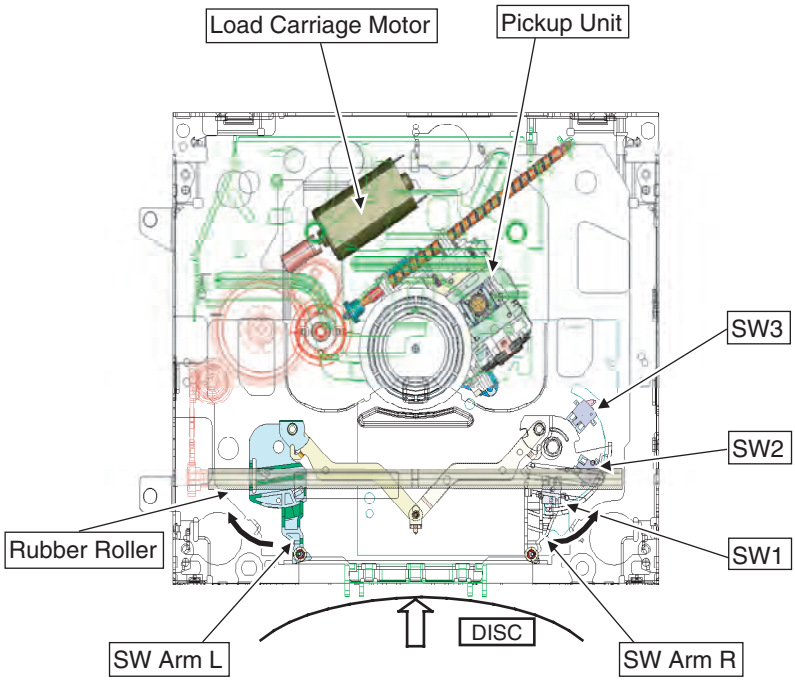


Fig.1.4.4 Status change in LOAD and EJECT modes

2. MECHANISM DESCRIPTIONS

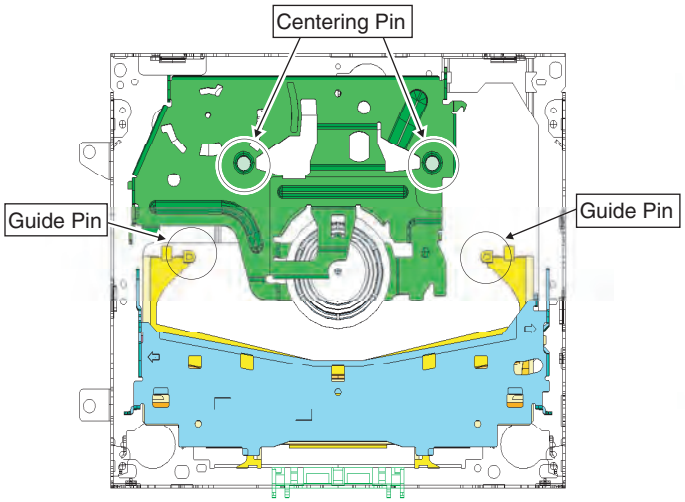
● Loading actions

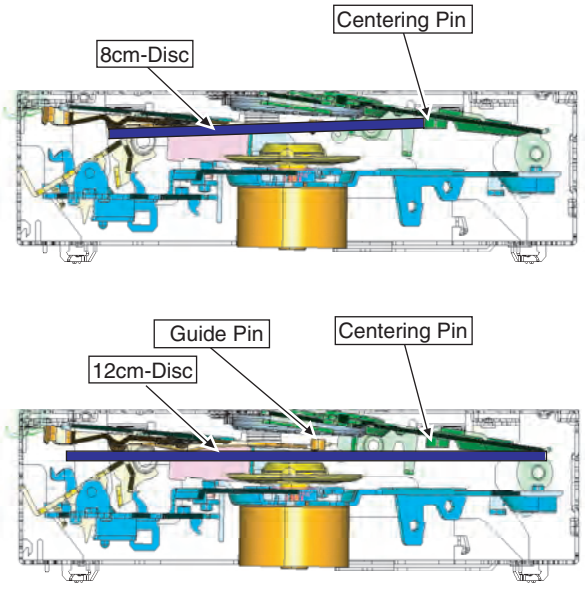
1. When a disc is inserted, SW Arm L and R rotate and SW1 is switched from ON to OFF.
   When SW1 is switched from ON to OFF, the Load Carriage Motor is started and the rubber roller rotates.
2. If the disc is a 12cm-disc, SW3 is turned ON with SW Arm, and the microcomputer determines that the disc is a 12cm-disc.
3. In case of an 8cm-disc, SW3 is not turned ON, a clamp action is triggered, and the microcomputer determines that the disc is an 8cm-disc.
   (The left and right of SW Arm are coupled, and when only one side is pushed, the coupled joint will lock, and the arms will not open more than a certain width (SW3 will not be turned ON).)



● Disc centering mechanism

1. 8cm-disc is centered by the Guide Pins and the Centering Pins.
2. 12cm-disc passes under the Guide Pins and the Centering Pins, and centered in the back position of the mechanism.





● Clamp actions mechanism

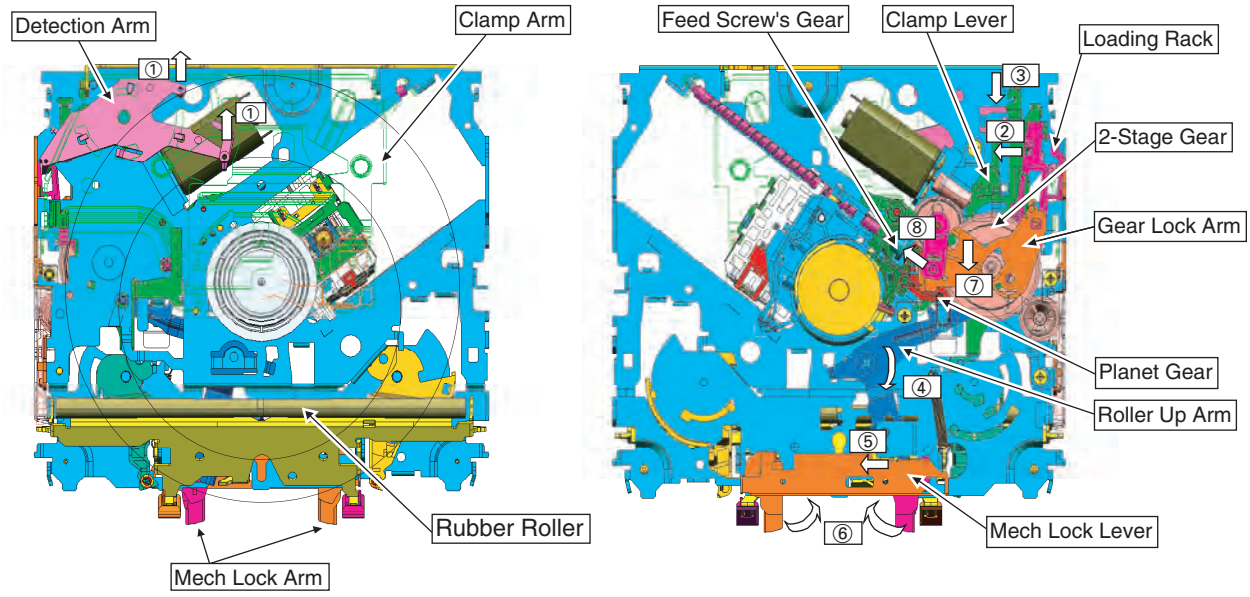
1. With an 8 or 12cm-disc centered on the spindle, the Detection Arm is moved.
2. The movement of the Detection Arm engages the Loading Rack with the 2-Stage Gear.
3. The Clamp Lever slides and lowers the Clamp Arm (the disc is clamped).

At the same time, the Roller Up Arm is rotated, and the Rubber Roller is separated from the disc.

Also the arm slides the Mechanical Lock Lever, turns the Mechanical Lock Arm, and releases the mechanical lock, completing the clamp operation.

4. When the clamp action is completed, the Clamp Lever rotates the Gear Lock Arm.

When the arm is rotated, the Planet Gear is separated from the 2-Stage Gear and engaged with the gear of the pickup feed screw, and the carriage operation will start



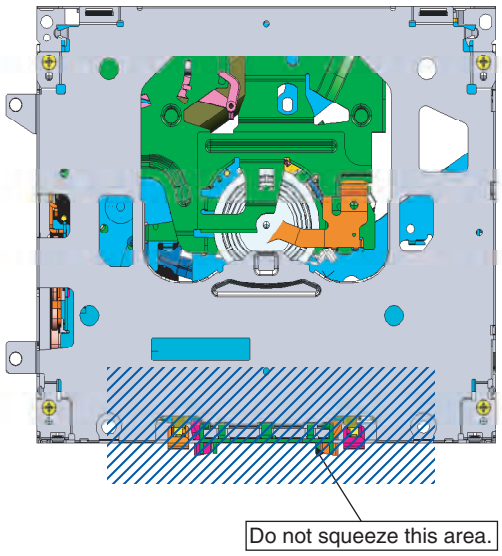
● Eject actions

1. When the Load Carriage Motor is rotated backward, and the pickup is fed to the inner periphery passing the home SW ON point, the eject action will start in the reverse order of the procedure mentioned earlier.
2. For a 12cm-disc, Eject is completed when SW3 is switched OFF, ON, and OFF again.
3. For an 8cm-disc, Eject is completed when SW2 is switched OFF, ON, and OFF again.

3. DISASSEMBLY

● How to hold the Mechanism Unit

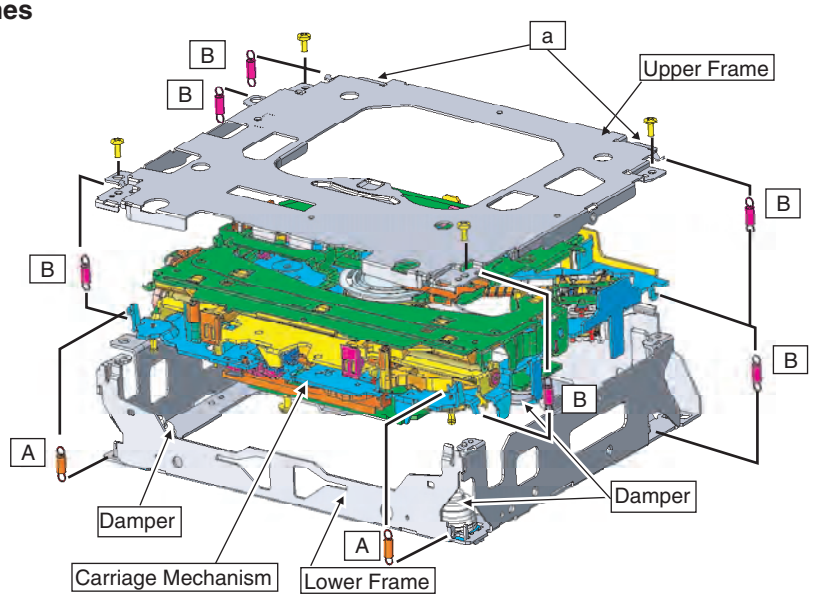
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

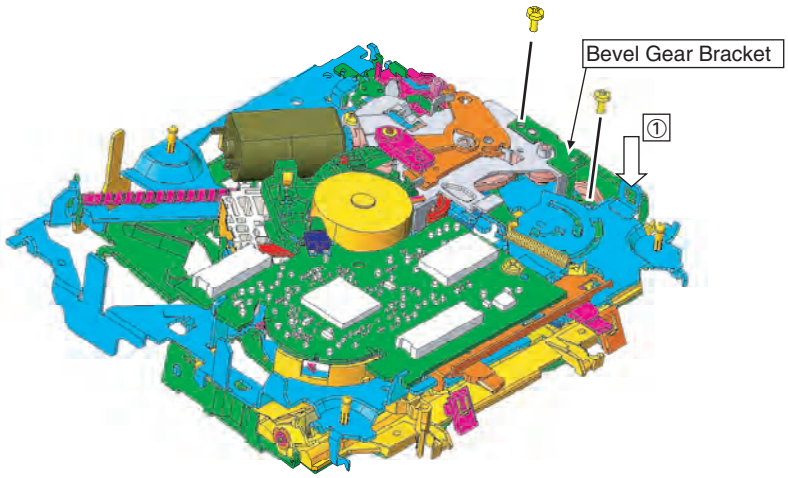
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.

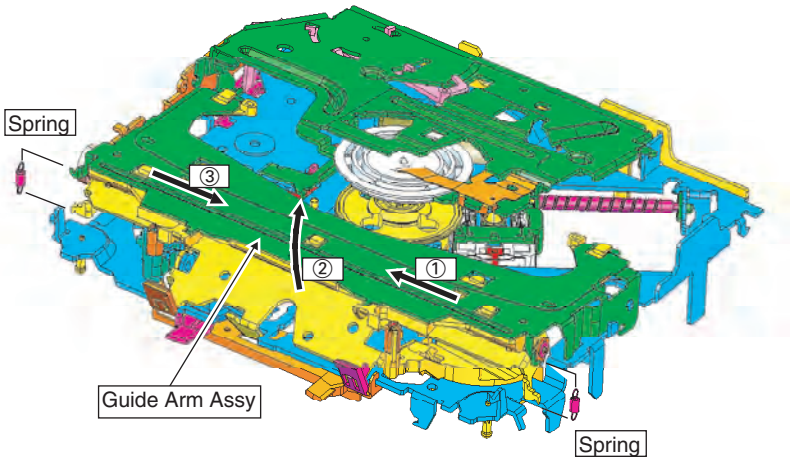


● Removing the Guide Arm Assy

1. Remove the Upper and Lower Frames and set the mechanism to the eject mode.
2. Remove the two Screws and Bevel Gear Bracket. (Note that the gears will come off.)
3. Remove the two Springs from the left and right sides.
4. Slide the Guide Arm Assy to the left, and turn it upward.
5. When it is turned about 45 degrees, slide it to the right and remove.

Caution: When assembling, assemble with the Bevel Gear Bracket moved to the direction of the arrow (①).

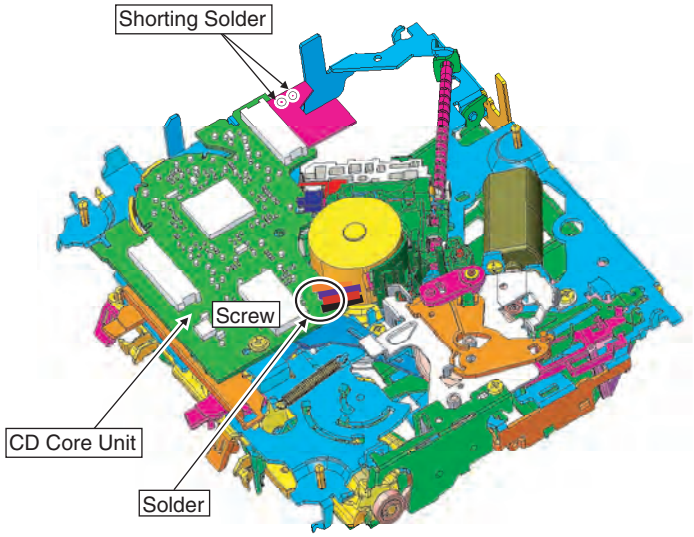




● How to remove the CD Core Unit

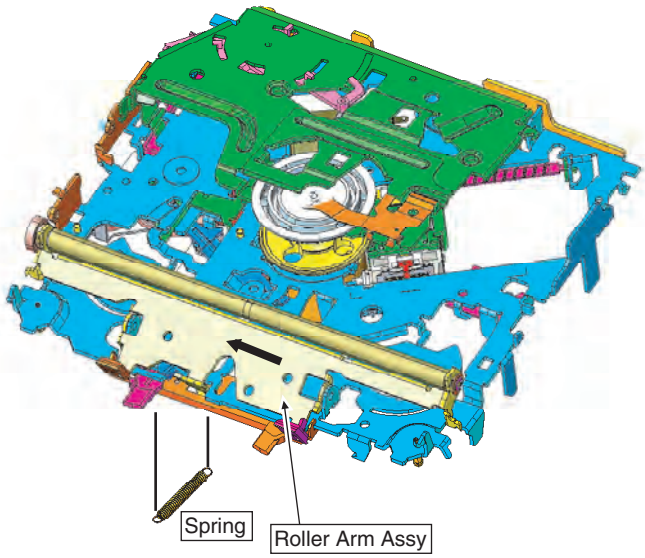
1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

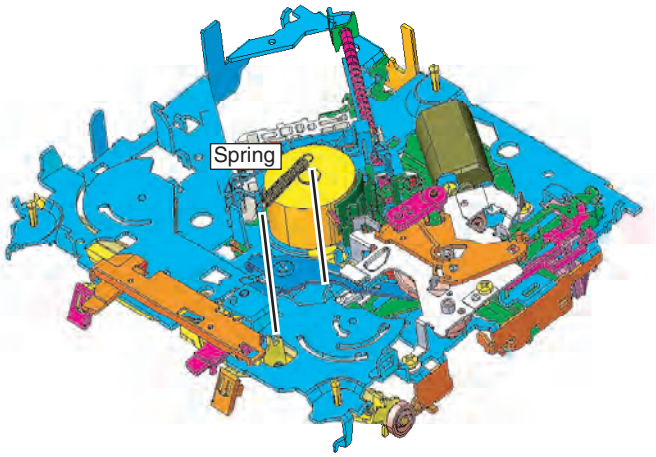
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



● How to remove the Roller Arm Assy

1. Remove the Guide Arm Assy.
2. Remove the CD Core Unit. (If the Spring can be removed, the unit need not be removed, depending on the type of CD Core Unit.)
3. Remove the Spring.
4. Slide the Roller Arm Assy to the left.



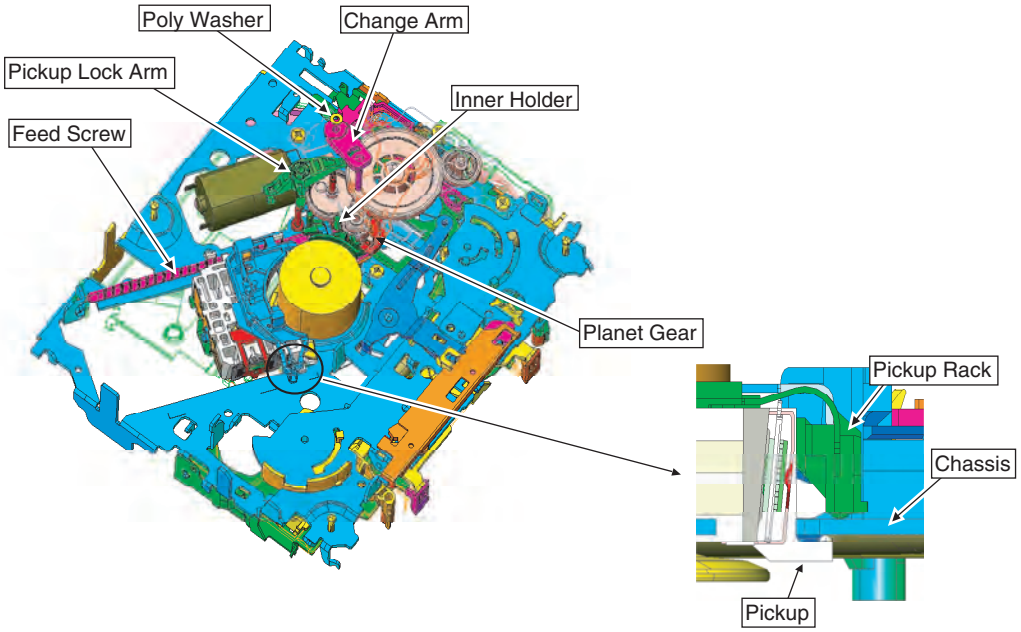


● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.

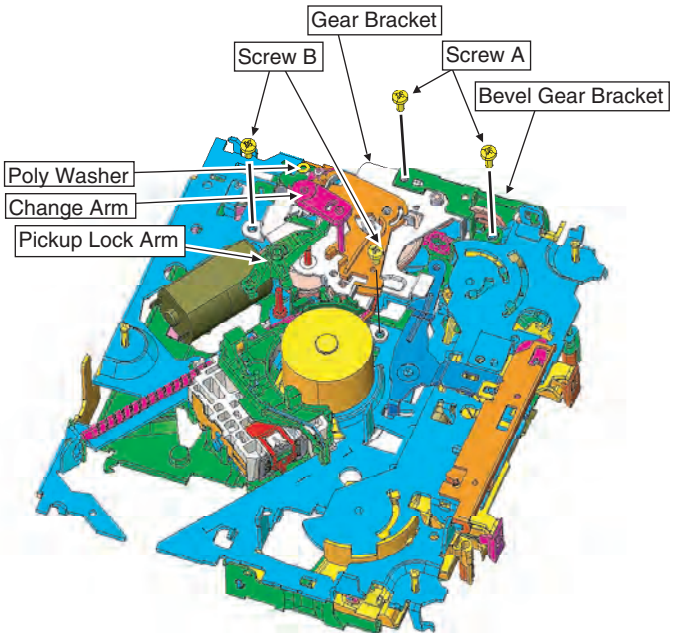
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.

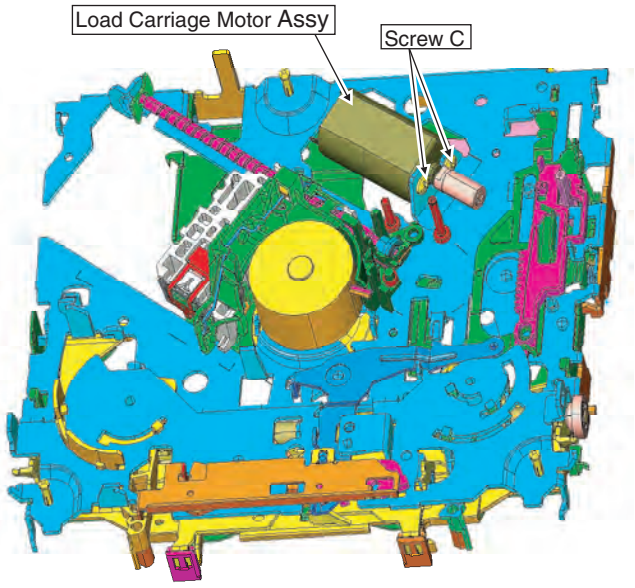


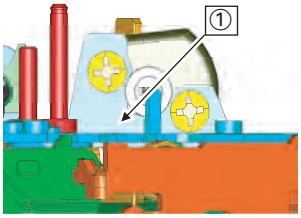
● How to remove the Load Carriage Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Release the leads (orange and purple) of Load Carriage Motor Assy from the CD Core Unit and remove the holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. Remove the two Screws (A) and the Bevel Gear Bracket (Note that the gears will come off).
5. Remove the two Screws (B) and the Gear Bracket (remove the CD Core Unit, if necessary), and remove all the gears.
6. Remove the two Screws (C) and the Load Carriage Motor Assy.

Caution: When assembling the Load Carriage Motor Assy, move it to the direction shown in the illustration (①).
When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



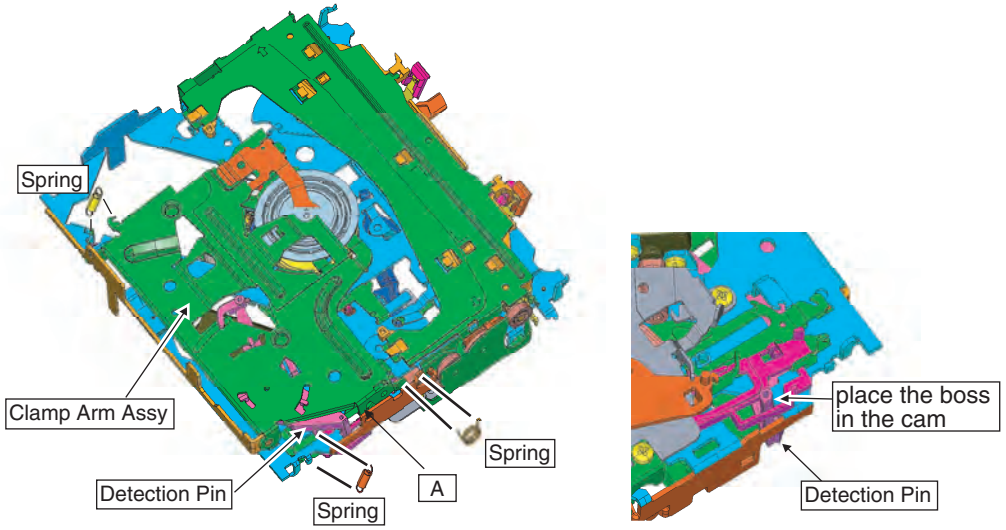




● How to remove the Clamp Arm Assy

1. Make the system in the carriage mechanism mode, and set the mechanism to the eject mode.
2. Remove the three Springs.
3. While pressing the position A, turn the Clamp Arm Assy upward, slide it to the left, and remove.

Caution: When assembling, place the boss of the Detection Pin in the cam unit of the Loading Rack.



● How to remove the Spindle Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Set the mechanism to the eject mode and remove the Clamp Arm Assy.
4. Set the mechanism to the clamped and move the Pickup to circumference.
5. Remove the two Screws, and remove the Spindle Motor Assy.